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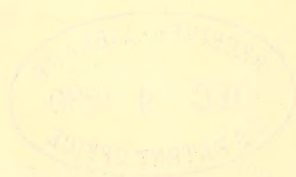
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THE AMERICAN JOURNAL OF PHARMACY.

JANUARY, 1880.

ON THE PRESENCE OF TANNIN IN GENTIAN.

BY JOHN M. MAISCH.

Read at the Pharmaceutical Meeting December 15, 1879:

In February, 1876, the writer read a paper on this subject, in which he believed to have proven that gentian root contains no tannin, and that the dark coloration produced with iron salts is due to gentianic or gentisic acid. These conclusions seemed to follow from the following observations:

1. That the infusion of gentian, sufficiently diluted so as to be filtered from the suspended pectin compounds, yields with gelatin a slight precipitate which after having been washed with cold water is *not* colored black or dark green by ferric chloride, but merely acquires the brownish color of ferric salts.

2. That the cold infusion of gentian, treated for 24 hours with a large fragment of fresh hide, showed not the slightest diminution in the dark coloration imparted by ferric chloride.

These experiments were supplemented by the following one performed by Mr. E. L. Patch, of Boston, and reported in the "Amer. Jour. Pharm.," 1876, p. 188. The alcoholic solution of the ethereal extract of gentian yielded with ferric salts dark green colorations, but on diluting it with water and filtering from the precipitated resin, etc., the clear liquid yielded *no precipitate* with gelatin, which should have occurred if tannin had been present.

In 1877 Mr. Jules Ville published an essay, which was reviewed in the "Amer. Jour. Pharm.," 1877, p. 429; he arrived at the conclusion that tannin is present in gentian, because

1. The infusion produces a slight precipitate with gelatin, and
2. The infusion treated with fresh hide, February 16th, gradually gave fainter reactions with ferric chloride, until on April 12th the infusion was insensible to the action of the reagent named.

Mr. Ville concluded that the *gentisic acid is the tannin of gentian*, but he failed to prove that the aqueous solution of this acid would yield a precipitate with gentian, or that the precipitate by gelatin in infusion of gentian, after having been washed with cold water, would be affected by ferric chloride. As to the gradual disappearance of the dark coloration by iron salts in infusion of gentian treated with fresh hide, I believe that this may be easily arrived at by the previous removal of pectin compounds, as indicated above, to such an extent that the color of the infusion will be scarcely darkened on the addition of the iron salt, owing to the very slight solubility of the coloring principle, gentisic acid, in cold water.

An abstract of Mr. Ville's essay will be found in the "Year Book of Pharmacy," 1877, p. 217, in which it is claimed, that "he obtained unmistakable indications of the presence of tannin with ferric chloride, gelatin and albumen," but I have failed to find in the essay itself any experiment which would disprove the observations made by myself and Mr. Patch in 1876. I then obtained the same reactions with ferric chloride and gelatin as Mr. Ville, but showed that neither was due to tannin.

At the last meeting of the British Pharmaceutical Conference a paper was read by Mr. Edward Davies ("Phar. Jour. and Trans.," 1879, Sept. 20, p. 220), in which the presence of a trace (0.08 per cent.) of tannin (probably *gallotannic acid*) in recently dried gentian root was inferred from precipitates obtained in the infusion by gelatin, acetate of cinchonia and tartar emetic, and from the distinct darkening of color by ferric chloride. Mr. Davies also observed that the infusion of powdered gentian would only be slightly darkened by ferric chloride, and yield a faint precipitate with gelatin after long standing, and no precipitate with tartar emetic; and he infers that this trace of tannin is liable to decomposition when the root is powdered and so exposed to oxidation; or that it is not a constant constituent of gentian root.

It will be observed that this is an entirely novel view of the question, differing very essentially from those advanced by Mr. Ville, and it is to be regretted that Mr. Davies did not prove his position completely, either by repeating the interesting experiment made by Mr. Patch, alluded to above, or by washing the gelatin precipitate and afterwards ascertaining the effect of ferric chloride upon it. The new reactions brought forward embrace tartar emetic and the salt of an alkaloid.

Desiring to examine these precipitates, I requested Mr. Chas. Baur,

a member of the present class, to make a series of experiments in the laboratory of the College, and he has complied with my request and carefully examined a sample of the same root, and a portion of the concentrated infusion, preserved by the addition of alcohol, with which I experimented about four years ago. He also procured three additional samples of gentian root of good and fresh appearance. The infusion had deposited a precipitate of a pectin compound; filtered and freed from alcohol by evaporation, the liquid gave *no* precipitate with gelatin. The old root yielded by percolation with cold water a rather thick and opaque infusion, which produced a dark greenish-black color with ferric chloride, and a gelatinous precipitate with gelatin. But since the infusion could not be obtained perfectly transparent by filtration, and since alum solution would also precipitate it, it was diluted with about an equal bulk of water, and on standing over night a similar gelatinous precipitate of pectin had separated, and the clear filtrate was *not* precipitated by gelatin, even after prolonged standing, and yielded only a very slight coloration on the addition of ferric chloride. A dilute infusion of the same root was left in contact for over a week with a large piece of fresh hide, when ferric chloride produced merely a slight tint of the same intensity as in the beginning of the experiment.

The infusions prepared from two other samples of root were not disturbed by gelatin. The third sample apparently yielded a slight precipitate with gelatin on standing; but it was noticed that another portion of the same infusion, to which no gelatin had been added, likewise separated a precipitate similar in amount and appearance to that formed after the addition of the gelatin, and evidently consisting of a pectin compound. After removing this spontaneous precipitate by filtration, the liquid was not disturbed by gelatin, tartar emetic or sulphate of cinchonidia.

Since it was found impossible to procure gentian root, the clear infusion of which would give a decided precipitate with gelatin, further experiments were not made; but Mr. Baur has taken steps for obtaining recently dug gentian root from Europe and expects to continue the investigation.

From the observations thus far made, I believe it is safe to conclude that commercial gentian root is free from tannin. The pectin present in the root is doubtless altered in the course of time, and possibly converted into the pectonic acid of Frémy, or a similar compound, which, while not entirely insoluble in water, becomes so in the presence of

various salts, and probably also by gelatin and other substances. In separating from the imperfect solution, most of the yellow coloring matter is carried down with it; hence the gelatinous precipitate, after the mother liquor has been drained off, acquires a deep green-black color on the addition of ferric salt, and on account of the sparing solubility of the gentisic acid in water, needs copious washing with water to free it from this compound, after which it will not be colored dark by the same reagent. In the same manner may also be explained the result of Mr. Ville's experiment with hide, and possibly the behavior of the infusion observed by Mr. Davies with tartar emetic and cinchonia salt.

ANEMOPSIS CALIFORNICA, Hooker.—YERBA MANSA.

By J. U. LLOYD.

This is a small perennial plant growing in damp situations in the southern part of California and Northern Mexico. The leaves are mostly radical, smooth, of a firm texture, and borne on sheathing petioles. The stem is about six inches high, bearing a clasping leaf near the middle, and terminating in a spike of flowers. The flowers are small, apetalous, cohering into a thick spadix, which is surrounded at the base by about six petaloid bracts, giving the entire inflorescence the appearance of a single terminal flower. A prominent character of the plant is its tendency to produce stolons.

In 1876 the writer received a specimen of the plant through the kindness of Dr. George, of California. It was known as "*Yerba Mansa*" in his neighborhood, and used as a domestic remedy. This specimen was fresh, and upon cultivation grew vigorously, passing the hard winter of 1878-79 with impunity. The characteristics of the native grown plants were preserved, but while there was a rapid increase in the number of plants by means of runners, none have blossomed.

The plant, which belongs to the order Saururacæ, was noticed in this journal, December, 1878, p. 589, by Dr. Edward Palmer in his interesting article upon "Plants used by the Indians of the United States," as follows:

"The root of this plant is a great remedy among the Indians of Arizona and Sonora, in Mexico and Southern California. It has a strong peppery taste and odor. A tea made from the roots and a pow-

der prepared from the same and applied to venereal sores are a great remedy. The powder is advantageously used on cuts and sores, as it is very astringent. The leaves, after being wilted, and applied to swellings, are a sure cure." In connection with this the following examination may be of interest.

All parts of the plant exhale, when broken, a pungent, disagreeable, penetrating odor. The taste is aromatic and peppery. Alcohol readily extracts all the sensible characteristics. Water simply becomes flavored when boiled with the root, the filtrate being astringent and highly charged with glucose. It does not afford precipitates with the usual reagents for alkaloids. The odor and taste of the plant is derived from a volatile oil; this is obtained, according to our experiments, in the proportion of six fluid drachms to the avoirdupois pound by distilling the dried root with water.

ESSENTIAL OIL, *A*.—This is heavier than water, yellowish, very refractive and to the taste sharp, pungent and possessing in a high degree the characteristic odor and flavor of the plant. It dissolves in all proportions in alcohol, ether, chloroform and carbon disulphide. When mixed with an equal bulk of sulphuric acid heat is evolved, and a thick, dark red liquid results. This dissolves in alcohol and chloroform, with production of a beautiful red color; is insoluble in ether, but becomes thinner when mixed with it and permitted to separate. This substance does not retain the odor of the oil.

When the essential oil is poured upon the surface of freshly prepared nitro-muriatic acid in a test tube and gently agitated, it turns blue; then with evolution of nitric oxide and a sudden increase of temperature decomposes, the result being a brownish resinous substance; the natural odor of the oil disappears, and the underlying acid changes to a red color.

When the essential oil is in like manner poured upon the surface of hydrochloric acid and gently agitated, a gradual change in color to deep blue results; in the course of twenty hours passes into violet, then changes to purple, and lastly to brown. The natural odor of the oil remains.

After distillation with water the root has a slight odor of the oil, an astringent taste and a benumbing action upon the tongue.

ALCOHOL seems to extract all the sensible properties of the recently dried root. When percolated with this menstruum a dark reddish tinc-

ture results. Upon evaporating from it the alcohol at 150°F. the residuum separates into a reddish oil, *B*, and a stiff gummy substance, *C*.

CHARACTERISTICS OF THE OIL, *B*.—It is heavier than water. The odor and taste is exactly like that imparted when the root is chewed. It dissolves in alcohol, ether, chloroform and disulphide of carbon, but from the latter solution a small amount of flocculent reddish matter separates. When the solution in disulphide of carbon is filtered, a light-colored oil results, seemingly similar to the essential oil *A*, obtained by distillation, the color being somewhat darker. The flocculent red precipitate is astringent and deliquescent, absorbing moisture and forming a red liquid. It is the material that gives the red color to the oil *B* and constitutes a considerable proportion of the bulk of the

GUMMY SUBSTANCE, *C*.—This is purified from adhering oil by trituration with carbon disulphide, the residuum being granular, astringent and peppery, and of a brownish color, soluble in dilute alcohol, and mostly soluble in glycerin. It dries by exposure to cool atmosphere, but melts to a red varnish-like substance at the temperature of 125°F. to 150°F. When the dry powder is triturated with water a flocculent substance remains, astringent to the taste, soluble in glycerin, alcohol and dilute alcohol; insoluble in chloroform, ether and carbon disulphide; precipitates black from solution in glycerin and dilute alcohol, with ferrous sulphate, and is negative to action of the usual precipitants for alkaloids. The filtrate from the precipitate *C*, after rubbing with water, is almost colorless, astringent, precipitates black with ferrous sulphate, and when boiled with Fehling's solution yields a heavy red precipitate. It fails to respond to reagents for alkaloids. When the precipitate *C* is triturated with ether and chloroform a portion dissolves and an astringent substance remains, which deliquesces upon exposure, forming a red gummy substance, eventually liquefying. This seems to be the same as the substance that separated from the oil *B* by the action of carbon disulphide.

The residuum within the percolator, after extraction with alcohol, seemed thoroughly exhausted. Water and acidulated water are somewhat astringent after maceration with it, odorless, react with Fehling's solution, but not with tests for alkaloids. Ether and disulphide of carbon fail to extract a vegetable wax, resin or other constituent worthy of attention, and inert extractive matter and mineral salts of no importance, together with woody matter, thus far have been found.

THE PREPARATION OF SPIRIT OF NITROUS ETHER.

BY R. F. FAIRTHORNE, PH.G.

Read at the Pharmaceutical Meeting December 15.

Amongst other members of the committee on the revision of the Pharmacopœia, having the duty assigned to me of reviewing that class of substances in which spirit of nitrous ether is included, I would respectfully make a few suggestions. The uncertainty of strength of sweet spirit of nitre, as made by the officinal formula, owing chiefly, perhaps, to the extreme volatility of nitrous ether and the difficulty of determining its ethereal strength, make it desirable that a process should be devised by which such uncertainty should be avoided, and I would propose the following as meeting these requirements, namely: First, to make the nitrous ether, which I accomplish without the use of heat or distillation; then to mix 5 parts of this with 95 parts of alcohol, so as to have a preparation of definite composition in accordance with the supposed strength of the article, as made by the present formula.

If 5 parts, by weight, of nitric acid, of specific gravity 1.36, are mixed with 4 parts of alcohol, of specific gravity .822, both liquids having, previous to mixing, been reduced to the temperature of 60°F., no perceptible action takes place. To this is added a small portion of starch (30 grains to 9 ounces of the mixture), and the whole placed in a deep cylindrical vessel, in which the liquids would occupy about one-sixth of its capacity. If the vessel is then set aside in a cool place, the temperature of which is above the freezing point but below 60°F., in two or three days the liquid will be found divided into two distinct layers, the upper one being impure nitrous ether. This is removed by means of a funnel having a stop-cock in the neck, and after pouring it into a four-ounce well-stoppered vial, it is agitated first with 3 per cent. of calcined magnesia, and to the mixture is added 8 per cent. of stronger solution of ammonia, and well shaken; the upper layer of liquid, which is the purified nitrous ether, is filtered through cotton, moderately packed in a funnel, and then weighed. To every 100 parts, by weight, are added 1900 parts of alcohol, of specific gravity .822. By this treatment of the crude nitrous ether, both free acid and aldehyd are removed, the first by the magnesia and the last by the ammonia, which has a strong affinity for it.

In order to succeed with this process it is necessary to bear in mind that the ether is extremely volatile (boiling between 61 and 62°F.), and

that the action of the acid upon the alcohol must be moderated if ebullition should take place too rapidly, which is sometimes the case when the temperature approaches 60°F . This can easily be accomplished by placing the bottle containing the acid and alcohol in water, the temperature of which is below 50°F . I have found it to be a convenient plan to allow the water from the hydrant (the temperature of which at this time is 50°F .) to run on the bottle for about half an hour, when the action will be checked.

Another method by which nitrous ethers can be made, and which requires less attention, is as follows: Place $4\frac{1}{2}$ parts by weight of nitric acid in a vessel of similar proportions to the one used in the first process, and with a long-necked funnel pour into it with care 2 parts of water so as not to mix with the acid, and on this pour $4\frac{1}{2}$ parts of alcohol in the same manner so as not to mix with the water. There will be three distinct layers at first, but having placed this in a cool place, and under the same conditions as before described, there will be found in two or three days only 2 layers, the upper one being impure nitrous ether. This is to be treated in the same manner as in the previous process.

The great volatility of nitrous ether renders it necessary, in order to avoid loss, that all vessels used during the purifying process should be maintained at a temperature below 60°F .

I would also state that by the first process named 572 grains pure ether were produced, having a specific gravity of about .908 and boiling at 62°F .

I prefer the first named method for making nitrous ether, the yield by it being larger and sufficiently great, even with my imperfect apparatus, to produce spirit of nitre at a cost not above that of the best commercial article.

Before giving .908 as the specific gravity of nitrous ether, I wish to rectify it over chloride of calcium or quick lime.¹ The spirit of nitre produced by either process, mixed with ammonia, does not become yellow, does not discolor with solution of potassa, and does not effervesce on the addition of a carbonate.

¹Liebig gives the specific gravity of nitrous ether at 15°C . (59°F .) at .947, and its boiling point at 16.4°C . = 61.5°F .—EDITOR

MOLLISINE.

BY WILLIAM C. BAKES, PH.G.

Read at the Pharmaceutical Meeting December 15, 1879.

The increasing popularity of petroleum in its various forms, as a medicinal agent, has led to the introduction of several proprietary preparations which claim to be made exclusively from petroleum. The convenience to the pharmacist of having a stable and reliable preparation of his own make to offer in place of such proprietary articles will be apparent.

Last summer my attention was called to a brief note in the "American Druggists' Circular," suggesting a formula for a substitute for *cosmolin* and *vaselin*.

I procured some of the spindle oil and made a number of experiments with various substances; paraffin did not answer a good purpose—it produced a flakey ointment which was quite unsightly.

Yellow wax seems much better suited as a congealing substance, and I find the following to yield a nice unguent of good consistence and permanent.

The proportions are as follows: Spindle oil (Downer's), 29° gravity, 4 parts; purified yellow wax, 1 part.

Melt the wax in the oil by the aid of a gentle heat, then set aside to cool; the result is a smooth ointment readily fusible without any odor of petroleum. I have given the name of *Mollisine* to this product from "Mollis," soft, pliant, sweet, easy, delightful, smooth, and "ine," belonging, relating or pertaining to.

This serves as an excellent base for a variety of substances, in combination with carbolic acid. I have prepared a *Carbolized Mollisine* in the proportion of 1 part carbolic acid to 16 parts of *Mollisine*.

A very satisfactory zinc ointment may be made in the usual proportions, substituting *Mollisine* for lard, and adding balsam of Peru in the proportion of 1 drachm to each ounce.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

The Volatile Oil of *Myroxylon peruiferum*, Lin., has, according to Dr. Theod. Peckolt, the specific gravity 0.892 at +13°C. and 0.852

at $+15^{\circ}\text{R.}$, is slightly yellowish, but may be obtained colorless by redistilling, and has a pleasant, aromatic odor, resembling sassafras, and a burning, aromatic taste. It does not change the color of test papers, burns with a bright flame and aromatic smoke, and is not affected by sodium, but reacts very strongly with fuming nitric acid, forming ultimately a dark purple soft resin, which, after washing with water and drying, is brown, solid, readily pulverizable, and insoluble in cold but soluble in boiling alcohol. The combined action upon the oil of nitric and sulphuric acids yields also a brown resinous mass, having a mild aromatic musk-odor. One gram of oil yields 0.60 gram of this resin, which retains its musk-odor for a long time, and is well adapted as a substitute for musk. The ultimate result of its reaction with sulphuric acid is a dark brown soft resin, having a terebinthinous odor.—*Ztschr. d. Allg. Oest. Ap. Ver.*, Oct. 20, 1879, p. 441.

Menthol as an Antiseptic.—The ordinary Japanese or Chinese oil of peppermint (Took-chang-yonk) contains so much stearopten (menthol) that it is a solid mass at the ordinary temperature. A liquid oil of peppermint, called "Poho-Oil," or "Poho-Essence," was also introduced into Europe, and greatly resembles the German oil, but has a slightly bitter taste. It is said to be distilled from "*Mentha Javanica*," a variety of *Mentha arvensis*, Lin. The solidified oil is probably separated in China by the influence of cold on the liquid oil, and was recently warmly recommended by Duncan as an antiseptic equal to thymol.—*Pharm. Centralh.*, Oct. 23, 1879, p. 394.

Pilocarpina, as a hair restorer, was recommended by Dr. Schmidt, who is now corroborated by Schueller. The remedy is employed by injecting hypodermically about 0.005 to 0.01 pilocarpina muriate twice daily.—*Pharm. Centralh.*, Oct. 23, 1879, p. 400.

Balsamum salicylico-benzoinatum, or benzoin balsam, is recommended as a suitable, cheap substitute for Peru balsam, which it greatly resembles. It is particularly well adapted for veterinary practice, and is applied externally directly to small wounds or excoriations, a single application being usually sufficient to heal the wound in a few days. It is prepared according to the following formula:

R	Benzoë: Siam. contusæ,	.	.	.	.	100.0
	Picis nigrae,	.	.	.	.	15.0
	Acidi salicylici,	.	.	.	.	10.0
	Balsami gurgjunici,	.	.	.	.	40.0
	Spiritus vini absoluti,	.	.	.	.	500.0

Mix and digest for a few hours, stirring from time to time, set aside to settle, decant the liquid, strain, remove a portion of the alcohol by distilling from a water-bath and dilute the remaining mass after cooling with sufficient absolute alcohol to give the mixture a thin syrupy consistence.—*Pharm. Centralb.*, Oct. 30, 1879, p. 408.

Action of Potassium Permanganate on Oil of Turpentine.—Oil of turpentine, when kept for some time in partly-filled and not airtight bottles, resinifies (oxidizes) to a certain extent, and then possesses bleaching properties, which were formerly attributed to the presence of ozone in the old oil. Boettger's recent investigations prove, however, that it contains no ozone, but traces of hydrogen peroxide. This can be shown by oxidizing a fresh distilled oil by adding to it, drop by drop, stirring continually, an aqueous potassium permanganate solution, when the oil becomes gradually loaded with hydrogen peroxide.—*Pharm. Post*, Nov. 1, 1879, p. 325, from *Polyt. Notizbl.*

The presence of hydrogen peroxide in partially oxidized oil of turpentine, is detected by pouring a little ethylic ether on a few cubic centimeters of the oil contained in a test-tube, and adding double its bulk of distilled water, a few drops of starch solution containing cadmium iodide, and a small crystal of iron sulphate. On gently agitating the test-tube the lower aqueous layer will turn intensely blue in a few minutes in case hydrogen peroxide is present.—*Pharm. Zig.*, Nov. 1, 1879, p. 326, from *Polyt. Notizbl.*

Tests for Adulterations in Volatile Oil of Mustard.—Hager recommends the following:

1. *Evaporation.*—One or two grams of the oil are evaporated in a shallow dish at from 40° to 50°C. If pure, the oil evaporates totally in the course of two hours; a residue indicates the presence of fatty oils, phenol, oil of cloves, oil of cinnamon or myrbane oil, etc.

2. *Dropping into cold water.*—Strictly pure oil sinks in water, and remains clear for hours. If the drops become cloudy or milky in a minute, 1 per cent. of alcohol or amylic alcohol is present.

3. *Pure concentrated sulphuric acid.*—Ten drops of the oil are mixed in a test-tube with 4 or 5 cc. of sulphuric acid, when no change of color is produced if the oil is pure; a darker coloration indicates the presence of adulterations, such as fatty oils, myrbane oil, carbon bisulphide, chloroform, etc.

4. *Solution of ammoniated copper.*—The solution is made by adding ammonia gradually to a concentrated aqueous solution of copper sulphate until the precipitate is redissolved. To 10 drops of the suspected oil, dissolved in about 4 cc. of pure absolute alcohol, add 2 or 3 cc. of the copper solution, when an ultramarine-blue precipitate falls, which does not change its color if the oil is pure. If a trace of carbon bisulphide is present the precipitate turns first violet-brown, and then dark reddish-brown in a few minutes; the presence of amylic alcohol, phenol or oil of cloves also causes a change of the color.

5. *Test for carbolic acid.*—Mix 10 drops of the suspected oil with 10 cc. of water; shake, filter 15 minutes later, and add to the filtrate 2 drops of solution of ferric chloride (*Phar. Ger.*), when the presence of carbolic acid is indicated by a blue coloration.

6. *Test for carbon bisulphide.*—This adulterant was quantitatively determined by distilling 100 grams of the oil, contained in a previously-weighed glass retort, first in a water-bath and afterwards in a glycerin-bath. The carbon bisulphide began to distil at 60°C., and continued to come over until the temperature had been raised to 103°C.—*Pharm. Centralb.*, Sept. 25, 1879, p. 361–363.

A new Anthelmintic, known at Buenos Ayres as *Albahaca*, is supposed by Hager (*“Pharm. Centralh.”* 1879, p. 343) to be not *Ocimum basilicum*, as stated, but the herb of *Ocimum incanescens*, *Martius*, or of an allied species. It has been recommended by Dr. Lemos as an always reliable anthelmintic, superior to calomel, santonin, kousso and kamala, and to possess at the same time the decided advantage over most other similar remedies of being entirely harmless. It is stated not to have the slightest injurious effects, even if taken by patients not suffering with helminthiasis; in such cases it simply acts as a pleasant cathartic.—*Pharm. Ztschr. f. Russl.*, 1879, p. 591, from *Allg. Med. Centr. Ztg.*

The Acid of *Drosera intermedia*.—Lucas and Trommsdorff regarded the free acid of this plant to be malic; Reess and Will believed it to be a mixture of formic, propionic and butyric acids, and Hager, of both citric and malic acid. G. Stein now proves it to be citric acid. The expressed, intensely red juice of *D. intermedia*, collected shortly before flowering, was treated with lead acetate, the dirty, grayish-green lead salt was washed and decomposed by sulphuretted hydrogen, and the acid, which is soluble in water, was obtained by evaporating the

filtrate on a water-bath and allowing the remaining brownish syrup to crystallize; most of the acid separated in well-defined rhombic prisms, which with lead, formed an entirely white salt. Stein believes that all Droseraceæ contain citric acid.—*Pharm. Ztg.*, Oct., 22, 1879, p. 654, from *Ber. d. Deutsch. Chem. Ges.*, 1879.

Disguising the Odor of Iodoform (see also "Am. Jour. Pharm.," 1879, p. 190).—The addition of oil of peppermint was successfully resorted to by Vulpius. Dr. Lindemann prefers oil of cloves and balsam of Peru, and prescribes 2 parts of the balsam to 1 pint of iodoform. Iodoform ointment is prepared either with lard, glycerin ointment, or soft paraffin, and a liquid preparation is made with glycerin, alcohol or collodion, as follows:

R Iodoform,	1'0	Or, R Iodoform,	1'0
Balsam of Peru,	2'0	Balsam of Peru,	3'0
Lard (or glycerin ointment or soft paraffin),	8 0	Alcohol (or glycerin or collo- dion),	12'0

Mix, in both cases, the iodoform first with the balsam and then add the vehicle.—*Pharm. Ztg.*, Oct. 25, 1879, p. 663, from *Allg. Med. Central Ztg.*

Use of Pepsin.—Finzelberg has observed that quinia, digitalis, the mineral acids and other medicines, when combined with pepsin, may be given for a long time without impairing the digestive apparatus. In order to prevent the injurious effects of acid liquids upon the teeth the desired dose of pepsin is placed on a wafer and a little cavity is pressed into it with the finger, into this the acid is dropped and covered with a little pepsin, after which the wafer is closed and taken as usual. Quinia-pepsin powders may be prepared in the same manner with acid, the efficacy of the quinia, as well as that of the pepsin, being increased by the addition of the acid.—*Pharm. Ztg.*, Oct. 25, 1879, p. 663.

Dialyzed Soap.—The solid opodeldoc, officinal in the German Pharmacopœia, frequently separates star-shaped crystals after standing for some time. E. Dieterich believes this to be due to the crystallizable salts present in every soap, and obviates the difficulty by dialysis, by suspending parchment-paper bags, containing a concentrated solution of soap, in hot water for some days, then evaporating the water used in dissolving, and drying the soaps; the latter are then used by the author for opodeldoc in the proportion of 16 grams of dialyzed oil-tallow soap,

or 12 grams of dialyzed stearin soap, to 320 grams of alcohol. G. Berg considers these quantities of dialyzed soap too small, and states that opodeldoc, thus prepared, will become partially liquid during the hot season; he, therefore, increases the proportion to 20 parts oil-tallow soap, or 16 stearin soap, to 320 parts alcohol, and thus obtains the preparation permanently transparent, clear and solid.—*Pharm. Ztg.*, Nov. 1, 1879, p. 678.

Syrupus glycyrrhizæ, corresponding in strength to the syrup official in the German Pharmacopœia, but being clearer and more elegant if prepared carefully, is made by H. Reinige by dissolving 1 part of purified extract of liquorice in 1 part of distilled water, and adding 17 parts of simple syrup and 12 parts of purified honey.—*Pharm. Ztg.*, Nov. 5, 1879, p. 687.

R. Scherff recommends boiling for a few minutes $3\frac{1}{2}$ pounds of honey with $1\frac{1}{2}$ pounds of water, 5 grams of Irish moss and 0.10 of tannin, straining through a woolen cloth, adding sufficient water to the strained mixture to make it weigh 6 pounds, dissolving in it $3\frac{1}{2}$ pounds of sugar by heating gently, straining through linen, adding to the cooled liquid 10 grams of purified extract of liquorice root, dissolved in 25 grams of warm water, and 25 grams of alcohol and filtering.—*Pharm. Ztg.*, Oct. 29, 1879, p. 673.

The Active Constituent of Insect-Powder (see "*Amer. Jour. Pharm.*," 1877, p. 17).—G. dal Sie has been studying the constituents of *Pyrethrum* (*Chrysanthemum*) *cinerariæfolium* since 1873, and found it to contain a volatile acid soluble in ether, alcohol and water, which seems to exist in a free state in the plant. Ether extracted a crystallizable acid and also an aromatic acid, having an oily consistence at the ordinary temperature. Alcohol extracted a resinous substance, which was decomposed by dilute sulphuric acid into sugar and another product. The author is still continuing his investigations, but feels convinced that the volatile acid is the active principle.—*Pharm. Centralb.*, Oct. 2, 1879, p. 371, from *Ztschr. d. Allg. Oest. Apoth. Ver.*

Estimation of Morphia in Opium.—E. Mylius proposes a modification of Flückiger's process as follows: 8 grams of powdered opium, air-dry, are macerated with 80 grams of water for 12 hours, and 42.5 grams of the filtrate (=4 grams of opium) are mixed in a flask having a capacity of 100 cc., with 12 grams of alcohol, spec. grav. 0.830;

10 grams of ether, spec. grav. 0.728, and 1.5 gram of ammonia, spec. grav. 0.960. The mixture is set aside for 24 hours, at the expiration of which time the morphia crystals are collected on a filter having a diameter of 3 or 4 centimeters; the crystals remaining in the flask are loosened, either by means of a glass rod, or by shaking with a piece of platinum foil, and are also transferred to the filter, where the morphia is washed with 10 grams of a mixture of equal bulks of ether and alcohol. The filter is then dried by pressing with bibulous paper and by keeping it at 100°C. for half an hour; is allowed to regain its hygroscopic water by remaining in the air for half an hour, and is then weighed. The morphia is now removed from the filter, and the latter again weighed. To the quantity of morphia thus determined 0.088 gram is added, the sum being the total amount of morphia present in 4 grams of opium.—*Archiv d. Pharm.*, Oct., 1879, p. 310.

Solubility of Morphia in Alcohol and Chloroform.—Prof. van der Burg finds pure morphia soluble in absolute alcohol to the very small extent of 1 in 15,000. It is soluble in 150 parts of chloroform, containing 10 parts alcohol; but if contaminated with narcotia, which is very soluble in chloroform—of course much less of the solvent is required.—*Pharm. Ztg.*, Nov. 8, 1879, p. 696, from *Pharm. Weckbl.*

Chininum crudum, Chinium and Quinium, are the different names mentioned by Hager under which a crude, blackish-brown quinia is found in the German market, the quinia strength of which is equivalent to 60 per cent. of that in quinia sulphate, while its cost is less than one-seventh of the pure quinia salt, for which reason it is particularly well adapted for poor patients.

Chinetum or *Quinetum* represents the impure cinchona bark alkaloids as obtained from the bark of *Cinchona succirubra*. The total percentage of quinia and quinidia hydrates often amounts to 40 per cent., and that of cinchonidia to 55 per cent. *Chinetum* is a chamois-colored or reddish-yellow or yellow dry powder, scarcely soluble in water, but readily so in alcohol. Hager thinks that the quinia value in *chinetum* is equivalent to three fourths of that contained in quinia sulphate, which would make it also an extraordinarily cheap and good substitute for that salt.—*Pharm. Centralb.*, Sept. 4, 1879, p. 339.

Determination of Alkaloids in Plants.—After criticising the principal methods now in use, A. Loesch publishes the following new

method: Heat a weighed portion of the contused or coarsely-powdered plant twice successively for three hours on a water-bath with 90 per cent. alcohol, previously acidulated with muriatic acid, express, wash with alcohol of the same strength, unite the alcoholic liquids, distil off about two thirds, filter the cooled residue, wash the filter with alcohol, evaporate the filtrate on a water-bath to the consistence of an extract, heat the residue with water equal to double the weight of the substance examined, and containing a little sulphuric acid; allow to cool, filter, mix the filtrate with three times its bulk of alum solution saturated at the ordinary temperature, heat, add ammonia in slight excess, evaporate the whole on a water-bath, powder the residue, and then treat it successively with ether, chloroform, amylic-alcohol, and finally with 90 per cent. alcohol, evaporating each extraction and drying the residues. Thus the total quantity of alkaloids is not only extracted in a pure state, but the different alkaloids sometimes contained in the same plant being soluble respectively in the different solvents, are obtained separate, and may usually be distinguished by their different solubilities.—*Pharm. Ztschr. f. Russl.*, Sept. 15, 1879, p. 545.

Detection of Free Acids.—Donath adds to the substance in aqueous solution a few drops of potassium iodide and potassium dichromate, and then several cubic centimeters of carbon bisulphide, when the latter will turn violet if free acid is present.

Free sulphuric acid in vinegar is ascertained, by the same author, by boiling 20 cc. of vinegar with 9.5 grams of lead chromate for 1 minute; filtering, adding to the filtrate, after cooling, several grains potassium iodide, and then shaking with carbon bisulphide, which will be colored violet if free sulphuric acid be present in the vinegar. This test is sufficiently accurate to detect the presence of 0.1 per cent. of this acid.—*Pharm. Centralh.*, Sept. 11, 1879, p. 348, from *Polyt. Journ.*

New substitute for isinglass, gelatin and glue is made by C. A. Sahlstroem, at Stockholm, by first thoroughly soaking fishes, or parts of fishes, in fresh water, and then for three or four hours in a solution of about 85 grams of chlorinated lime in 25 or 30 liters of water; they are now washed, treated for 30 or 40 minutes with a solution of about 5 grams of potassium permanganate in 25 or 30 liters of water, and exposed to the influence either of nitrous acid vapors, produced from 300 or 400 grams of nitric acid for every 40 kilograms of raw

material, or of sulphurous acid vapors, produced by burning about 200 grams sulphur for the same weight of raw material. The latter is then rinsed off, and the portion, intended as a substitute for isinglass, deprived of the outer skin, dried at a moderate heat and pressed, while the portion intended for gelatin or glue is exposed for about 10 or 12 hours to a heat of from 40 to 50°C., when the greater portion is dissolved; it is then forced through a strainer or sieve and dried.—*Pharm. Handelsb.*, Nov. 5, 1879, p. 45.

New Mineral Gum.—This gum is reported to be an excellent substitute for gum arabic, glue, etc., and to make an excellent cement with gypsum, and consists of a solution of aluminium phosphate in sulphuric or phosphoric acid. It is said to be made by moistening 380 pounds rodondo phosphate (?) with 15 gallons of water, adding 10 gallons of sulphuric acid, specific gravity 1.6, previously diluted with 35 gallons of water; boiling the mixture for several hours, then filtering by means of a Needham's press, concentrating the solution, adding a little more phosphate while concentrating, and removing an excess of acid, if present, by lime.

If phosphoric acid is used instead of sulphuric acid, it is made by the action of sulphuric acid on bone-dust.—*Ibid.*, Nov. 5, 1879, p. 45.

CHEMICAL NOTES.

BY PROF SAMUEL P. SADTLER.

Inorganic Chemistry.—*On a new Method of Preparing Hydrobromic and Hydriodic Acid Gas.*—G. Bruylants has sought to avail himself of the fact that bromine and iodine combine at ordinary temperatures with many organic bodies, and under the influence of heat, escape as hydrobromic or hydriodic acid gases, in preparing these gases for use. Of different organic bodies tried he finds that oil of copaiba works most readily, giving up almost, if not quite, all the bromine or iodine in the form of hydrogen bromide or iodide. The oil should distill at 250° to 255°C., and should be previously dried over calcium chloride. Some 50 per cent. of such oil, or even at times 80 per cent., may be gotten from the copaiba balsam. A given amount of this oil will convert three times its weight of bromine or iodine into the corresponding hydrogen compound: 60 grams of oil were taken and placed in a

retort or flask, connected with an inverted condenser, the upper end of which connected with a tube for drying gases. After warming the oil, 20 grams of iodine were gradually dissolved and the whole heated, when an abundant and regular evolution of gas commenced. When it had ceased the retort was allowed to cool somewhat and a fresh portion of iodine added. In this way 150 grams of iodine were converted into 145 to 150 grams of hydrogen iodide. Bromine acts in the same way when dropped in from a funnel tube provided with stop-cock. The copaiba oil gradually solidifies during this reaction, and cymol was recognized among the products.—*Ber. der Chem. Ges.*, xii, p. 2059.

On the Volatility of Platinum in Chlorine Gas.—As bearing upon the recent results of Victor Meyer, on the behavior of chlorine at high temperatures, F. Seelheim gives some experiments made by him upon the volatility of platinum. He found that platinum, heated to bright redness, while a slow stream of chlorine gas was passed over it, was volatilized, and well-defined crystals were gotten in the cooler part of the tube. Platinous chloride was decomposed when heated in a tube to bright redness, and crystals of platinum were also gotten. Now, the observed increase in volume of the chlorine, in Victor Meyer's experiment, may be explained in part by this volatilization of platinum from the platinous chloride used without any necessity of supposing a decomposition of the chlorine.—*Idem.*, xii, p. 2066.

On the Antiseptic Action of the Acids.—Miss Nadina Sieber has published the results of a series of experiments which were made to establish how much acid was necessary to prevent decomposition in solutions charged with fermenting materials. It was found that the presence of 0.5 per cent. of hydrochloric, sulphuric, phosphoric and acetic acid was sufficient to prevent perfectly this decomposition; of butyric acid about 1 per cent. was necessary, and of lactic acid even more. In the case of boracic acid even 4 per cent. was not sufficient to completely prevent decomposition, while half of a per cent. of phenol had pronounced antiseptic properties.—*Jour. für pr. Chem.*, 19, p. 433.

Organic Chemistry.—*On the Antiseptic Properties of Pyrogallol Acid.*—V. Bovet has shown 1), that pyrogallol acid in 1 to 1½ per cent. solution hinders the decomposition of animal tissue; 2), that in 2 to 2½ per cent. solution a material, smelling strongly and filled with bacteria, is

deprived of its odor and the organisms killed in a very short time ; 3), that in 2 per cent. solution the alcoholic fermentation and likewise the formation of mould is prevented.—*Idem.*, p. 445.

On Carbohydrates.—Franchimont has made studies upon several of the sugar varieties, which may be summarized as follows:

I. On Tunicin or Animal Cellulose. The mass, purified by treatment with acids, alkalies, alcohol and ether, was dissolved in ammoniacal solution of cupric oxide and precipitated by hydrochloric acid, washed and dried. It was then treated with sulphuric acid in the cold and examined in the polariscope, when it showed right rotation. After boiling for 48 hours with inverted condenser, the excess of acid was removed with barium carbonate, and the solution concentrated to the point of crystallization. The substance so gotten had all the appearance of ordinary glucose, and showed similar rotatory power, diminishing after some hours nearly one-half. He considers the sugar formed as ordinary glucose, and therefore the tunicin may have the same formula as vegetable cellulose, although the possibility remains that it may be a multiple of it.

II. On Glucose. Upon attempting to get an acetyl compound from glucose by Liebermann's method, using acetic anhydride and fused sodium acetate, he obtained a compound, crystallizing out of ether in dazzling white cauliflower-like crystals, which appeared to be an octacetyl-saccharose formed from two molecules of glucose. This compound is not readily oxidizable, and the aldehyde character of glucose seems to have vanished entirely. The author proposes at a future date to make public some views on the structure of glucose which will explain this fact as observed.

III. On Vegetable Cellulose. Upon trying the Liebermann method upon ordinary Swedish filter paper no acetyl compound of cellulose was gotten until a few drops of sulphuric acid were added, when a strong reaction set in. Several products were gotten, the best crystallized of which seems to be a tri-glucose, containing eleven acetyl groups, a compound which might result from three molecules of glucose by the loss of two molecules of water. The author has studied also the acetyl derivatives of other carbohydrates, such as inulin, saccharose, starch and dextrin, and promises to communicate these results at a future time.—*Ber. der Chem. Ges.*, xii, p. 1938.

On a new base obtained from Quinia.—Wischnegradsky and Butlerow

had announced some time ago that cinchonia, under the influence of alkalis, was decomposed into chinolin and a solid compound, which subsequently on decomposition yielded ethyl-pyridin. From this was drawn the conclusion that cinchonia contained both the chinolin and the pyridin grouping. They had also shown that quinia, under the same treatment, yielded a base similar but not identical with chinolin, and a second compound corresponding to the ethyl-pyridin. They therefore thought it probable that the difference between quinia and cinchonia lay in the difference in the chinolin grouping, and that the oxygen atom, by which the two compounds differ, is in the chinolin group. They have now prepared this base, and find it to contain oxygen. The free base boils at 280° , under partial decomposition. Its composition appears to be $C_{10}H_9NO$. This differs from lepidin only by an atom of oxygen. Its solution, and the solution of its salts, show decided blue fluorescence. The authors will continue their study of this base.—*Ber. Chem. Ges.*, xii., p. 2093, St. Petersburg Corresp.

ON THE COTO BARKS AND THEIR CHARACTERISTIC CONSTITUENTS.

BY JUL. JOBST AND O. HESSE.

Abstract of a reprint from "Liebig's Annalen," vol. 199, p. 17-96. Communicated by the authors.

The investigations concerning coto bark, made by Wittstein, Hartz and von Gietl, have been previously reported ("Amer. Jour. Pharm.," 1875, p. 541); also the results of the chemical investigation by Jobst of true coto bark, and of a similar bark, named paracoto bark by the authors (*ibid.*, 1876, p. 352, 1877, p. 70). In Brazil the bark of *Palicourea densiflora*, Mart., nat. ord., Rubiaceæ, is known as *coto-coto*; but the origin of the two Bolivian barks, of which the paracoto bark is collected on the banks of the river Mapiri, has not been ascertained.

Coto bark is met with in flat or slightly curved pieces, either irregularly broken or 0.6 meter long, 60 millimeters wide and from 8 to 14 millimeters thick. It is deprived of the corky layer, of which occasionally small patches remain, and has a reddish cinnamon color, darker upon the inner surface, and an agreeable odor, somewhat cinnamon-like, which, on bruising the bark, is more powerful and strongly stercoratory. The taste is biting, but neither bitter, mucilaginous or

astringent. The outer layer breaks granular and nearly even, but the inner bark has a coarsely fibrous and splintery fracture.

Hartz observed that the membranes of all the cells, except those of the sclerenchyma and liber are tinged blue by iodated zinc chloride, as well as by iodine and sulphuric acid, and therefore consist of pure cellulose. The sclerenchyma and bast cells are of a golden-yellow color and are not tinged by immersion in solution of iodine or rosanilin, and subsequent washing with glycerin; their walls consist of numerous concentric layers, which contain numerous pores, are woody and very hard. The outer and inner bark contain in the unthickened parenchyma cells a little tannin, reacting green with iron salts, phlobaphen-like substances, which are soluble in alkalies, a small quantity of little starch granules, and drops or globules composed of resin and volatile oils.

Paracoto bark is met with in pieces sometimes 0.7 meter long, 40 to 70 millimeters wide, and from 12 to 18 millimeters thick. The outer surface is frequently covered with the whitish, deeply fissured, cork; otherwise the color and the fracture are the same as in true coto bark. The odor is much fainter, and resembles that of nutmeg; the taste is slightly acid. This bark is at present much more common in the market than the former. In its medicinal action it is decidedly weaker.

The investigation of the chemical constituents gave the following results:

COTOIN.—The ethereal tincture of true coto bark is concentrated, and while still warm, mixed with warm petroleum benzin; on cooling a considerable quantity of a blackish-brown oleoresin is deposited, and the clear solution, left to spontaneous evaporation of the ether, separates large sulphur-yellow crystals of cotoin. The oleoresin is boiled with water and a little lime, the clear brown-yellow solution, while still hot, is supersaturated with acetic or hydrochloric acid, and the turbid liquid set aside for about twenty-four hours, when the cotoin will have crystallized in large shining yellowish crystalline plates, and upon these in single needles or in acicular groups. The crystals are purified by recrystallization from boiling water with the addition of a little animal charcoal. This operation is very tedious, owing to the cotoin melting and its sparing solubility in this condition.

Thus prepared cotoin forms pale-yellow, usually curved prisms, but

is obtained in large prisms or plates on the slow evaporation of its solution in chloroform or alcohol. In the latter case it is occasionally obtained amorphous and crystallizes after some time. It is easily soluble in alcohol, chloroform, benzol, acetone and carbon bisulphide, but is nearly insoluble in petroleum naphtha. Cold water dissolves very little cotoin, but acquires a rather yellow color; it is somewhat more soluble in boiling water. Alkalies and alkaline carbonates dissolve cotoin readily and separate it again completely on the addition of hydrochloric or sulphuric acid. The same solutions treated with carbonic acid gas deposit by far the largest part of cotoin, which is also soluble in potassium disulphide and again precipitated by acids.

Concentrated nitric acid colors cotoin blood-red; on heating dissolves it with a blood-red color, and deposits a red resin on cooling or on the addition of water. Cotoin dissolves in concentrated sulphuric acid with a brown-yellow, and in warm hydrochloric acid with a yellow color, and crystallizes from the latter solution unaltered. The aqueous solution of cotoin has a neutral reaction, and reduces gold and silver salts in the cold; it is not precipitated by neutral acetate, but yields a yellow precipitate with basic acetate of lead, and a brownish-black precipitate, or in dilute solution a brownish-black color, with ferric chloride. The alcoholic solution of cotoin is colored intensely brown-red by ferric chloride, and yields, with aqueous solution of lead acetate, a yellow crystalline deposit of cotoin. Fehling's solution is reduced slowly in the cold, but rapidly on heating.

Cotoin has a burning acrid taste; its dust excites sneezing and coughing. It has no action on polarized light. It melts at 130°C . (266°F .) (if contaminated with even traces of resins at a lower point), and congeals on cooling in a crystalline condition. At a higher temperature it is decomposed. It is free from water of crystallization, its composition being represented by the empirical formula $\text{C}_{22}\text{H}_{18}\text{O}_6$. A saturated solution of cotoin in ammonia yields with lead acetate a bright-yellow, amorphous precipitate of trilead cotoin, $\text{C}_{22}\text{H}_{12}\text{Pb}_3\text{O}_6$.

When heated in a sealed tube for two hours to 140°C . with strong hydrochloric acid, benzoic acid and a little of a red amorphous substance is produced. Benzoic acid is also produced on melting cotoin with potassium hydrate, together with a small quantity of an oily substance having a bitter almond odor.

Tribromcotoin, $\text{C}_{22}\text{H}_{15}\text{Br}_3\text{O}_6$, is obtained by acting with bromine at the

common temperature upon cotoin dissolved in chloroform, evaporating the solvent and crystallizing from hot alcohol. It crystallizes in yellow prisms, melts at $114^{\circ}\text{C}.$, is nearly insoluble in cold water, but dissolves gradually in boiling water with a dark blood-red color. It is readily soluble in alcohol, chloroform and ether, and is colored yellow by cold, and dissolved by warm sulphuric acid with a dingy-brown color. Warm nitric acid produces a reddish-yellow resin.

Triacetylcotoin, $\text{C}_{22}\text{H}_{15}\text{O}_3(\text{C}_2\text{H}_3\text{O}_2)_3$, is obtained in large prisms on heating cotoin with acetic anhydrid in a sealed tube to 160° or $170^{\circ}\text{C}.$ for two hours, and recrystallizing from boiling water. It is freely soluble in chloroform and ether, less in cold alcohol, and is not colored by ferric chloride or warm nitric acid.

DICOTOIN.—On treating crude cotoin with boiling water, repeating the operation with the mother-liquor from the crystallized cotoin, after a while the foliaceous crystals increase in quantity and require to be separated mechanically from the cotoin. The authors formerly called this compound *cotonetin*, and gave it the formula $\text{C}_{20}\text{H}_{16}\text{O}_5$; but it is now regarded as *dicotoin*, of the formula $\text{C}_{44}\text{H}_{34}\text{O}_{11}$. It melts in boiling water and dissolves sparingly, separating on cooling again in pale yellow plates like cotoin. On dissolving the residue in ether, treating with animal charcoal and evaporating spontaneously, a yellow amorphous mass is obtained, which soon changes to tabular crystals of cotoin. Dicotoin is, therefore, the anhydrid of cotoin; it crystallizes in nearly white scales, which are readily soluble in alcohol, acetone, ether, chloroform, ammonia and soda solution. Its alcoholic solution is colored strongly brown-red with ferric chloride, and its solution in ammonia yields with lead acetate an amorphous yellow precipitate of variable composition.

PARACOTOIN.—The concentrated ethereal tincture of paracoto bark congeals in a few days to a crystalline mass, consisting of paracotoin, leucotin, oxyleucotin and dibenzoyl-hydrocoton. This is expressed to separate the resinous mother-liquor and recrystallized in fractions from hot alcohol, from which paracotoin crystallizes first. It is pure, when on boiling with strong nitric acid it is colored yellow or brownish-yellow, but not blue green. It forms pale yellow, shining laminæ, melting at $152^{\circ}\text{C}.$, congealing at $148^{\circ}\text{C}.$, and subliming at a higher temperature. It is easily soluble in ether, chloroform, and in boiling alcohol, acetone and benzol; also somewhat soluble in boiling water and

ammonia, and crystallizes from the hot solutions. It has a neutral reaction, is tasteless, and is not colored by ferric chloride. Its composition is $C_{19}H_{12}O_6$, and on being dissolved in solution of potassa or soda, it is converted into a weak acid—paracotoic acid, $C_{19}H_{17}O_7$. Sulphuric and nitric acid dissolve paracotoin yellowish brown, the warm solution of the latter depositing on cooling yellow prisms.

On adding bromine to the chloroformic solution of paracotoin hydrobromic acid is given off, and a scarlet-red crystalline precipitate is produced, which, on drying, becomes yellow and at $100^{\circ}C.$ green, with the evolution of hydrobromic acid; its composition is $C_{38}H_{21}Br_3O_{12}$.

On fusing paracotoin with caustic potassa, protocatechuic and formic acids are produced; and on boiling it with solution of potassa *paracumarbydrin*, $C_9H_8O_3$ is formed, which is in colorless scales of a coumarin-like odor; neutral to test paper, and freely soluble in ether, alcohol, acetone and chloroform, but sparingly soluble in cold water. At the same time an acid homologous with piperonylic acid is generated, and *paracotoic acid*, $C_{19}H_{14}O_7$, which is insoluble in water, readily soluble in alcohol and ether, and not colored by ferric chloride.

LEUCOTIN, $C_{34}H_{32}O_{10}$, is present in largest proportion among the crystalline constituents of paracoto bark, and is readily dissolved from the mixture by glacial acetic acid, and purified by recrystallization from warm dilute alcohol. It crystallizes in small white prisms, which are readily soluble in alcohol, ether, chloroform, acetone and glacial acetic acid. It melts at $97^{\circ}C.$, is not colored by ferric chloride, and yields with strong nitric acid a blue-green resin and a blue-green solution, which is rendered turbid by water. It yields with bromine *dibromleucotin*, $C_{34}H_{30}Br_2O_{10}$, and *tetrabromleucotin*, $C_{34}H_{28}Br_4O_{10}$, which are crystalline.

On fusing leucotin with potassa, hydrocoton, $C_{18}H_{24}O_6$ is volatilized, and protocatechuic and formic acid are formed, together with protocatechuic aldehyd, $C_7H_6O_3$, and *cotogenin* $C_{14}H_{14}O_5$, which is sparingly soluble in alcohol and ether, melts at $210^{\circ}C.$, and at a higher temperature yields pyrocatechin.

OXYLEUCOTIN, $C_{34}H_{32}O_{12}$, is left in the alcoholic mother-liquor of paracotoin. To free it from the latter warm potassa solution is used, and the undissolved oxyleucotin is crystallized from boiling alcohol or glacial acetic acid, on the cooling of which solvents it separates in handsome prisms, which are also soluble in warm chloroform, ether

and benzol. Warm nitric acid acquires with oxyleucotin a blue green color, and forms a resin of a similar color. Bromine produces two crystallizable substitution products, and fusing potassa decomposes oxyleucotin into hydrocoton, cotogenin and benzoic, protocatechuic and formic acids.

DIBENZOYLHYDROCOTON, $C_{32}H_{32}O_8$, is contained in the crude leucotin, and prepared by washing it with little glacial acetic acid, and recrystallizing the undissolved portion from the same solvent. It is readily soluble in hot alcohol and glacial acetic acid, and in cold chloroform, ether and aceton, and is insoluble in petroleum naphtha. Nitric acid produces a blue-green resin and liquid. With fusing potassa, hydrocoton and benzoic acid are formed, together with a little cotogenin and protocatechuic acid. Bromine yields two substitution compounds.

HYDROCOTON, $C_{15}H_{14}O_4$, remains in the resinous mother-liquor separated from the mixture of paracotin and other constituents. It is dissolved in dilute solution of soda, the liquid supersaturated with hydrochloric acid and the precipitate recrystallized from boiling alcohol. It forms large pale-yellow prisms or long thin needles, is sparingly soluble in petroleum naphtha, more so in ether, and freely soluble in chloroform and aceton. It has a neutral reaction, melts at $98^{\circ}C.$, and yields with ferric chloride a deep brown-red color, and with sulphuric acid a dark yellow solution. It yields substitution products with bromine and acetyl, and with fusing potassa is decomposed into hydrocoton and benzoic acid, probably with a little methylic alcohol.

PIPERONYLIC ACID, $C_8H_6O_4$.—Paracoto bark, exhausted with ether, is treated with lime and water, the alkaline liquid supersaturated with hydrochloric acid, agitated with ether, and this solution evaporated; the semi-crystalline mass is dissolved in boiling alcohol, when, on cooling, piperonylic acid¹ crystallizes. Coto bark, treated in the same manner yields the same acid, but in much smaller quantity. It is not altered by melting it with potassa, or by treatment with potassium permanganate. Its salts are mostly crystallizable; those with the alkalis are freely soluble in water, those with other metals are mostly sparingly soluble in cold water. The quinia piperonylate, $C_{20}H_{40}N_2O_2 \cdot C_8H_6O_4 + H_2O$, crystallizes in white needles, is rather freely soluble in hot

¹ This acid was discovered by Fittig and Mielck (1869) on treating piperic acid with potassium permanganate, when *piperonal*, having a coumarin-like odor, and *piperonylic acid* are produced, which sublimes at $228^{\circ}C.$ —EDITOR.

water, but requires, at $12^{\circ}\text{C}.$, 733 parts for solution. The quinidia (conchinia) salt is amorphous. The piperonylic ethyl ether is a thin, very refractive yellowish liquid of an agreeable fruit odor.

On treating piperonylic acid with concentrated nitric acid several nitro-compounds (nitropiperonylic acid, mononitro- and dinitro-methylenpyrocatechin) are obtained.

VOLATILE OIL OF PARACOTO BARK.—It is obtained by distillation with superheated steam, is colorless, has a neutral reaction, a very agreeable odor, at $15^{\circ}\text{C}.$ the specific gravity is $\cdot 9275$, and is slightly levogyre ($-2\cdot 12^{\circ}$ for 100 mm.). Five different compounds were obtained by the repeated fractional distillation of the volatile oil.

α *Paracoten*, $\text{C}_{12}\text{H}_{18}$, boils at $160^{\circ}\text{C}.$, has an odor resembling that of bitter almond and turpentine, does not absorb dry hydrochloric acid gas, and is colored red by sulphuric acid.

β *Paracoten*, $\text{C}_{11}\text{H}_{18}$, boils at 170 to $172^{\circ}\text{C}.$, has a slight agreeable odor, does not absorb hydrochloric acid gas, and is colored dark red by sulphuric acid.

α *Paracotol*, $\text{C}_{15}\text{H}_{24}\text{O}$, boils at 220 to $222^{\circ}\text{C}.$, has a faint odor, becomes green and then gray with bromine, and yields with sulphuric acid a red ointment-like mass, and with nitric acid a yellow resin.

β *Paracotol*, $\text{C}_{28}\text{H}_{40}\text{O}_6$, boils at $236^{\circ}\text{C}.$, has a faint aromatic odor, is colored blue and green by bromine, yields with nitric acid a red resin, and with sulphuric acid a red solution.

γ *Paracotol*, $\text{C}_{28}\text{H}_{40}\text{O}_2$, boils at 240 to $242^{\circ}\text{C}.$, and is the heaviest of these constituents, its spec. grav. being $\cdot 9650$. It has a very faint odor, behaves with sulphuric and nitric acids like the preceding oil, and detonates with bromine, acquiring at the same time a blue, then a violet red, and after 12 hours a dark green color.

PHYSIOLOGICAL AND THERAPEUTICAL ACTION.—Dr. Burkart observes that $0\cdot 5$ to $1\cdot 0$ gram of coto bark produces eructations, nausea, a continued feeling of warmth in the stomach, and even vomiting. The alcoholic tincture (1 : 9) has a biting and acrid taste, and applied to the skin produces hyperæmia of the part and burning; taken internally, it produces the same symptoms as the bark.

Paracotobark and its tincture act similar as the preceding, but the effect upon the skin, mucous membrane and sores is very weak.

From his use of coto bark and its tincture in private practice, as well as in the Ludwig's hospital at Stuttgart, Dr. Burkart confirms in

general the observations of Dr. von Gietl, that coto bark may be regarded as a specific against diarrhœa in its various modifications; but the unpleasant secondary effects seem to render it an undesirable remedy. Paracoto bark and its tincture were found to possess scarcely any effect in the disease mentioned.

Cotoin was used in doses of 0.05 gram every two or three hours, either in powder or in aqueous solution, with the addition of a flavoring excipient, and was found to be particularly useful in chronic intestinal catarrh combined with atonic condition of the membranes. Phthisical diarrhœas were alleviated and a diminution of the fever resulted. The observations in diarrhœa of children have as yet been too limited.

Cotoin is excreted through the urine within 4 or 6 hours after taking it, and may be recognized by its behavior to nitric acid. Dr. Burkart suggests that cotoin may be useful in cholera in the form of hypodermic injections.

Paracotoin was found by Dr. Burkart to have no action whatever upon the mucous membranes, and to be excreted with the urine. It was given in doses of 0.1 to 0.2 gram every two or three hours, in 24 cases of acute intestinal catarrh, 3 cases of cholera nostras and 6 cases of chronic intestinal catarrh. In 22 out of the 24 cases three or four doses effected a cure; in the other 2 cases no effect was observed. Two cases of cholera nostras were cured, ice and champaign having been given at the same time. The third case was a man 74 years old, who died on the third day. Three cases of chronic diarrhœa were those of consumptives, and were much benefitted. The other three cases required, respectively, 3 weeks, 2 weeks and 4 days for curing the diarrhœa.

Paracotoin has been successfully used, hypodermically, in 5 cases of cholera in Japan ("Centralbl. d. Medic. Wissensch.," 1878, p. 482); the chief difficulty for this form of medication being its limited solubility. Paracotoic acid, which is formed from paracotoin by the addition of 1 molecule H_2O , was experimented with by Dr. Burkart, who found it to possess a slight aromatic odor and taste, to irritate but little the mucous membranes of the mouth, to somewhat stimulate the secretion of saliva, and to produce a very insignificant irritation on wounds and sores; it may be given without inconvenience in doses of 0.5 to 1.0 gram, but is otherwise physiologically and therapeutically indifferent.

Three cases of diarrhœa, which paracotoic acid failed to relieve, yielded promptly to paracotoin.

Oxyleucotin, leucotin and hydrocotoin resemble cotoin and paracotoin in their action, but require very large doses to produce the same effects.

The five volatile oils of paracoto bark do not possess any important physiological action; the properties of that bark reside, therefore, almost exclusively in the paracotoin, and of true coto bark in cotoin. The volatile oil of the latter bark has not been further examined.

J. M. M.

AMMONIUM NITRITE and the BY-PRODUCTS obtained in the OZONIZATION of AIR by MOIST PHOSPHORUS.

BY A. R. LEEDS.

Sterry Hunt, as long ago as 1848, threw out the suggestion that the nitrogen of the atmosphere is really composed of two equivalents (atoms) of the element, sustaining toward each other the same relations as the two equivalents (atoms) in nitrous oxide. Schaeffer appears to have arrived at a similar conclusion concerning the dual nature of nitrogen, and holds Hunt's view, that it is the nitryl of ammonium nitrite, and capable of forming this body by assuming again the elements of water. In 1862 Schönbein published an extensive series of experiments on the generation of ammonium nitrite from water and atmospheric air under the influence of heat. In none of these experiments, however, was the precaution apparently taken to use air which had been purified from its pre-existing ammoniacal and nitrous compounds. In repeating these experiments Carius employed most elaborate precautions, using only air and water which had been most carefully purified. The water was evaporated both with a rapid and with a slow change of atmosphere, at various temperatures, from the ordinary temperature of the air to 100°, both alone and after addition of baryta, the latter being devoid of nitrogen compounds, in contact with platinum spirals, and diffused over a great surface of purified cotton-wool, but in no case was ammonium nitrite formed. In such experiments therefore it is of the highest importance to exclude the possibility of the formation of ammonium nitrite and nitrous compounds from any extraneous sources. In cases of rapid oxidation, like the combustion of hydrocarbons, fats, phosphorus and other bodies in

the air, if it be true that ammonium nitrite is formed, irrespective of any nitrogen compounds pre-existing in the atmosphere, the origin of this ammonium nitrite is to be looked for in other causes than the conjunction of atmospheric air and water-vapor under the influence of heat. The same remark applies if any ammonium nitrite is formed by the slow oxidation of phosphorus in contact with air and water.

Quite independently of the work done by other observers, an extended series of experiments was instituted by the author upon the phenomena which accompanied the ozonization of air by means of phosphorus. In the earlier trials, attention was limited to the question whether oxidized compounds of nitrogen were produced or not. Subsequently, the research was made to include all other by-products. It was deemed important to purify and measure the air used and the ozone formed, to determine the amount of phosphorus consumed and of phosphoric and phosphorous acids produced, and in case they were really present and it were possible to estimate them, the amounts of nitrogen compounds, of hydrogen peroxide and ozone, remaining in solution in the jar and wash-waters.

The phosphorus ozonator described in the "Journal of the American Chemical Society," vol. i, p. 8, was employed throughout the whole course of this investigation. The most important result which the author appears to have arrived at is that the chief by-product of the ozonization of moist air by phosphorus is not phosphorous acid but phosphoric acid. It is generally stated that the former of these two substances is the one principally formed under these circumstances. This may be true in the sense that the phosphorous acid is first formed and that it is gradually transformed into phosphoric acid under the influence of nascent ozone. The author could not determine this point very readily in the course of these experiments. It is certainly an error to ascribe, as is done in various text-books, the dense white fumes seen in the ozonizing chambers to ammonium nitrite—they are chiefly due to phosphoric anhydride.

The author's experiments do not permit him to say that no ammonium nitrite was formed during any period of the ozonization; they prove merely that no ammonium nitrite could be detected at its close. If therefore this body were produced, it must have become oxidized to ammonium nitrate.

As to the cause of the formation of ozone itself under these circum-

stances, it may be conjectured, with Lamont and others, that it is connected with the uneven quantivalence of the elements taking part in the reaction, which may be represented by the equation $P_4 + O_{14} = P_2O_3 + P_2O_5 + 2O_3$. If this be true, we should anticipate the development of ozone whenever oxidation of a perissad occurred at temperatures compatible with the stability of the ozone molecule. In entering into new combinations, the oxygen molecules must undergo temporary resolution into their constituent atoms. These, while in the course of taking up new positions in other combinations, and animated by their atomic energy or energy of the nascent state, may either oxidize the oxygen molecule, or the nitrogen, or the molecule of water. In the first case, ozone would be produced; in the second, regarding water as the basic body and NNO as the nitryl, there might be formed, as Hunt has indicated, ammonium nitrate; in the third, hydrogen peroxide.—*Four. Chem. Soc.*, Nov., 1879, p. 881, from *Chem. News*.

NICOTIN AND NICOTINIC ACID.

BY R. LAIBLIN.

The following modification of Schloesing's process for preparing nicotin is recommended: Coarsely-cut tobacco is digested for a day with cold water, and the mixture subsequently boiled by injection of superheated steam, filtered, and the residue pressed. The same series of operations is repeated, and the mixed filtrates are evaporated to one-third of their volume. A quantity of lime, one-tenth of the weight of the tobacco used, is now added, and the mixture distilled by a current of steam as long as nicotin (recognized by its odor) comes over. The distillate is exactly neutralized by oxalic acid, the amount used being noted, and evaporated to a thin syrup. The exact amount of potash necessary to neutralize the oxalic acid is now added, and the crude nicotin which separates is collected. The remaining liquid is exhausted with ether, and the nicotin thus extracted added to that first obtained. That portion of the crude base which distils over below 250° is converted into oxalate by adding powdered oxalic acid to its ethereal solution; and the purified oxalate, which separates as a syrup, after being

washed with ether, is dissolved in water and again decomposed with potash as above. The product is finally heated to $110^{\circ}\text{C}.$ for six hours by a paraffin-bath, and a slow stream of dry hydrogen passed through it to remove ammonia, ether and water. The temperature is then gradually raised to $210^{\circ}\text{C}.$ to complete the removal of the water, and on fractionally distilling the residue, pure nicotin comes over between 240 and $242^{\circ}\text{C}.$ It must be preserved in sealed tubes. One centner of tobacco thus treated yielded 600 grams of pure nicotin ($=1\frac{1}{2}$ per cent.), besides impure base.

Nicotin is not decomposed into well-defined simpler bodies by heating with hydrochloric acid at 280 and $300^{\circ}\text{C}.$ No addition product is formed by the action of nascent hydrogen on the brominated hydrobromide, $\text{C}_{10}\text{H}_{13}\text{N}_2\text{Br}_5$.

Nicotin is readily oxidized by potassium permanganate in the cold, but only when the salt is added to its solution as long as it is decolorized is it possible to obtain crystalline oxidation-products. By employing a suitable process, which is fully described, potassium carbonate and nicotinate are the sole products found. The nicotinate is dissolved out by absolute alcohol, and converted into silver salt by precipitation. Nicotinic acid may be obtained from this by decomposing it with hydrogen sulphide.

Nicotinic acid was first obtained by Huber, by oxidizing nicotin with chromic mixture, and was subsequently recognized by him as *carbopyridenic acid*, $\text{C}_5\text{H}_4\text{N}.\text{COOH}$ ("Ber.," 3, 849). Weidel also ("Annalen," 165, 328), by acting on nicotin with nitric acid, obtained an acid which he identified with Huber's and which the author, by a crystallographic comparison of salts, proves to be identical with his own; he, however, assigned to it the formula $\text{C}_{10}\text{H}_8\text{N}_2\text{O}_3$. By analyses of the acid and a variety of its salts (silver, calcium, potassium) and other compounds with hydrochloric acid and auric and platinic chlorides, the author decides in favor of Huber's formula. He also shows that when nicotinic acid is distilled with soda-lime, it yields a quantity of pyridene nearly equal to that which might be expected from a carbopyridenic acid. Moreover, nicotin yields carbopyridenic acid in almost molecular proportion.

Nicotinic acid forms crystalline compounds with hydrochloric and hydrobromic acids, of the formula $\text{C}_6\text{H}_5\text{NO}_2.\text{HCl}$ and $\text{C}_6\text{H}_5\text{NO}_2.\text{HBr}$.

Ethyl chlorocarbonate acts violently on pyridene, but does not form ethyl nicotinate; the only products are ethyl chloride, ethyl carbonate, and pyridene hydrochloride. Neither is ethyl nicotinate formed by acting with ethyl iodide on silver nicotinate. When the compound of nicotinic chloride with hydrochloric acid (see below) is treated with absolute alcohol, a violent action occurs, and the product evaporated in a desiccator deposits crystals of nicotinic acid hydrochloride. The mother liquor from these crystals gives with caustic soda an oily liquid, probably containing the ether, which no doubt existed in combination with hydrochloric acid.

If nicotinic acid, or better, potassium nicotinate, is treated with phosphorus pentachloride, energetic action ensues, and a volatile crystalline compound sublimes, the analysis of which corresponds approximately with the formula $C_5H_4N.COCl.HCl$. This chloride is insoluble in ether, chloroform, benzin, and petroleum-ether. When heated with water it is reconverted into nicotinic acid; but no amide could be formed from it by the action of ammonia.

When the double chloride of zinc and nicotin, $C_{10}H_{14}N_2.2HCl + ZnCl_2 + 4H_2O$, is distilled with soda-lime, a large quantity of gas is given off, containing ammonia, methylamin, free hydrogen and traces of hydrocarbons. The liquid distillate consists principally of nicotin, but contains also a considerable quantity of pyrrol, which was separated by fractional distillation, and analyzed as the cadmium double salt. By carefully adding water to the fraction $245-270^\circ$, containing much nicotin, an oily liquid was separated, which, when dissolved in hydrochloric acid and fractionally precipitated by platonic chloride gave a carmine-red easily decomposable double salt, $(C_{10}H_{11}N.HCl)_2.PtCl_4$. The free base is a yellowish liquid of extremely penetrating and repulsive odor, boiling between 250 and 270° . The smallest quantity of it, dissolved in hydrochloric acid, gives an intensely red solution when boiled with platonic chloride. It is probably formed from nicotin by the direct separation of ammonia, $C_{10}H_{14}N_2 - NH_3 = C_{10}H_{11}N$.—*Jour. Chem. Soc.*, Oct., 1879, from *Liebig's Annalen*.

COMMERCIAL TRIMETHYLAMIN.

By E. DUVILLIER AND A. BUISINE.

Commercial trimethylamin prepared by the dry distillation of beet molasses, contains other substances besides trimethylamin. It is free from ammonia, and when treated with oxalic ether yields a dense white precipitate. The filtrate concentrated by distillation yields a further precipitate. These two precipitates are mixed, and separated by boiling water into three portions, one which is insoluble in hot water, but which melts and floats on the surface of the liquid, and solidifies like wax on cooling; another more soluble in hot water than the first; and a third still more soluble, especially in hot water.

The first body, which is di-isobutyloxamide, after recrystallization from alcohol, is obtained in pearly needles, which melt in boiling water. The free base has a slightly aromatic odor, and yields a platinochloride crystallizing in orange-colored plates, and slightly soluble in water.

The second product crystallizes from alcohol in pearly needles (m. p. 110°), and consists of dipropyloxamide. The free base gives an orange colored precipitate with platinum chloride.

By recrystallizing the third product from water and alcohol, a granular substance is obtained, intermediate between dipropyloxamide and dimethyloxamide. The presence of the former body is probably the cause of the latter not crystallizing in the ordinary manner. This body when decomposed with potash yields a base which forms a golden-yellow precipitate with platinum chloride, possessing all the properties of the methylamin compound described by Wurtz (*"Ann. Chem. Phys."* [3], 30, 457), and with which the results of the analyses correspond.

The bodies not precipitated by oxalic ether consist of di- and trimethylamin, and are contained in the mother-liquors (residue and distillate). The bases are distilled and collected in absolute alcohol, and the solution treated with oxalic ether. When the reaction has ceased, the liquid is distilled, and the unattacked base which distils over consists of trimethylamin.

The residue is dissolved in water, and caustic baryta is added; barium oxalate is precipitated, which is separated, and the excess of baryta precipitated with carbonic anhydride. The filtrate is evaporated, and the residue dissolved in alcohol at 80° . On cooling, an amorphous mass is left, perfectly insoluble in absolute alcohol, but very soluble in

water. It consists of barium dimethyl-oxamate, and on decomposition with potash yields dimethylamin, the double platinum salt of which forms octohedra.

It is, therefore, evident that commercial trimethylamin is not pure, as Vincent ("Bull. Soc. Chim.," 29, 194, and 217, 151) declares it to be. The quantity of trimethylamin present is but small, only from 5 to 10 per cent., that of the dimethylamin being about 50 per cent., whilst the remainder consists of methylamin, propylamin and butylamin, in about equal proportions.—*Jour. Chem. Soc.*, Nov., 1879, from *Compt. rend.*

L. T. O'S.

THE OIL OF CALOPHYLLUM INOPHYLLUM.

By J. E. O'CONNER, Simla.

This tree is a member of the natural order *Guttiferae*, an order which includes many useful and valuable trees, such as that from which gamboge is obtained, the *Mesua ferrea*, yielding an excellent timber, the mangosteen, and others. It is grown extensively in Java, Ceylon and India; in Bengal, in Madras, in Travancore; in the Andamans (where Mr. Kurz says it attains an enormous size) and other places, succeeding best, it is said, near the seacoast. Roxburgh states that it is indigenous near the shores of the southern parts. Inland it is rare, and indeed almost non-existent. It is believed that it will not thrive beyond a certain distance from the coast. In Calcutta it is to be seen in the Botanic Gardens, and is not uncommon in private gardens, in many of which it has attained large dimensions. The tree is one of very ornamental appearance, and is well worth cultivation if only for the beauty of its foliage and fragrant flowers. It is described in botanical language as having opposite, simple, coriaceous, shiny, closely-veined, entire leaves, and axillary drooping racemes of fragrant, white, polygamous flowers.

From the seed-kernels there exudes on pressure an oil which is used as a lamp oil, and by the natives as a medicine for external application in rheumatism. The oil is variously called *Pinnay* and *Poon* oil in Southern India (these being also names applied to the tree), *Poonung* in Orissa, and *Surpun-ka tel* in Hindustani. The Hindustani name of the tree, according to Roxburgh, is *Sultana Champa*. It is in flower and fruit most part of the year, but the harvest for oil generally occurs twice a year, viz.: in August-September, and February-March.

Dr. Balfour informs us that the wood of the tree is employed in Ceylon for masts and cross-sticks of dhonies and fishing-boats, and poles of bullock carts. A cubic foot of the timber weighs 40 pounds. It is coarse-grained but very strong, durable and ornamental, and on the Madras coast is used for ship-building. He adds, on the authority of Mr. Dalrymple, that no tree is superior to this for ships' knees and crooked timber. In Java, Dr. Balfour says, it is cultivated for the sake of its shade and the fragrance of its flowers, and he recommends it as worthy of attention because it will grow well in sandy tracts close to the sea where few others thrive.

The oil is manufactured and used in Bombay, in Tinnevely and other parts of India as a lamp oil. The seeds from which it is obtained are very oleaginous and yield about 60 per cent of their weight of oil.¹ The fresh seeds when shelled and subjected to pressure yield a dark-green oil of a peculiar odor; old seeds yield a higher colored and thicker product. Formerly the seed and oil were shipped from Madras to the Straits and Ceylon, but it has now ceased to be an article of export. In Tanjore, 437 acres, producing on an average $24\frac{5}{8}$ cullums per acre of seed, are covered with this tree. This yields $2,671\frac{1}{4}$ maunds of oil at Rs. 20'4 per maund. In Tinnevely it costs 4 annas and 8 pies, and in Trichinopoly 4 annas per seer. In Tanjore it is used for lamps and for caulking vessels, but is chiefly valuable as a medicine. It is seldom procurable in the bazaar, but is expressed when required. (Balfour's "Cyclopædia of India").

Major Drury, "Useful Plants of India," says that the gum which flows from the wounded branches being mixed with strips of the bark and leaves, is steeped in water, and the oil which rises to the surface is used as an application to sore eyes. Dr. Waring, in the "Pharmacopœia of India," says, that the kernels yield a grateful-smelling fixed oil, held by the natives in high esteem as an external application for rheumatism. From the bark and roots exudes a resinous substance, which has been thought, apparently erroneously, to be the Tacamahaca of old pharmacologists. It is stated in the "Bengal Dispensatory" to resemble myrrh, and to be a useful application to indolent ulcers. True East India Tacamahaca is said, by Lindley, to be the produce of

¹Apparently this is an excessive estimate. It is doubtful whether any seed would yield such a large quantity of oil. Castor-seed, for instance, which is highly oleaginous, only yields about 25 per cent. of its bulk in oil.

Calophyllum Calaba, a tree indigenous in Malabar and other parts of the Madras Peninsula.

The medicinal qualities of the oil seem somewhat doubtful. It is certainly held in some repute among the natives as a remedy in rheumatism, but they hold many other oils in equal estimation for the same purpose, and in most cases they are inert except mechanically, by protecting the surface of the affected part from the action of extremes of temperature. In Calcutta the local European druggists are not acquainted with the oil as a medicinal agent, nor does it seem to be known in commerce.

The only sample I have met with was at the Economic Museum. This sample, which was received from Pooree, is a clear oil of dark color, and rather disagreeable odor. It would apparently be well adapted for burning, and it is for this purpose it would seem that the oil is most used. Dr. Hill, Civil Surgeon of Pooree, says that there the oil is only used for burning, though the native doctor in charge of the dispensary uses it in the preparation of ointments. The only account I have been able to find of the cultivation of the tree is given in a recent report by Bahu Nand Kishor Das, Deputy-Collector of Pooree. This report was sent to the Economic Museum with the sample above referred to. The Bahu writes: "The tree is here called Punang. It grows well in sandy soil. The seeds are sown in the ground where the trees are intended to grow, and transplantation is rarely resorted to.¹ Until the trees grow to the height of about five or six feet they require to be constantly watered and protected from cattle. They bear fruit when they are about five years old, the trees yielding two harvests of oil seeds annually, in August and again in February, when the seeds are gathered (those only that are intended to be used as seeds for taansplantation being allowed to fall when ripe). The seeds being gathered, are beaten with a small wooden hammer or some such thing, which causes the separation of the shell from the kernel, which is then cut, sliced and dried in the sun, and is then put in the mill. The mill used for the purpose is the common country mill, which consists of a small trunk of wood in which a hole is made

¹ From personal experience I should say that a good method of propagation would be to let the seeds germinate where they fall in the shade of the parent tree. This they do freely. The transplantation of the young plants when nine or ten inches high is, if carefully done, attended with hardly any loss.

in the form of a frustrum of a cone, the circumference of the hole being wider at the bottom than at the top. The oil-seed is deposited in the hole, which has a long axis, and the motion is given to the axis by bullocks yoked in a horizontal piece of wood attached to the same by another piece of wood cut into a curved form. A given quantity of seeds will produce one-third of its weight of oils; thus, three sers of seeds will produce one ser of oil. The ordinary price of the oil now-a-days is 8 Rs. per maund (of 80 tolahs weight). The oil produced here is of the dirtiest kind, and no method of refining is known to the manufacturer. The cake is used for fuel, and sometimes in lieu of oil for burning. It is not used as food for animals or for manuring."

Dr. Hill states that the bazaar price of the oil when he wrote was six annas the ser of 105 tolahs. When the crop is first gathered, which, he says, is three times a year, viz.: in June-July, November-December and February-March, the price falls to three sers per rupee. At these rates the oil could not compete with castor-oil, the best quality of which is now selling in the Calcutta market at 10 Rs., the maund, unless it could be laid down in great abundance, and of very superior quality. The refining of the crude oil would no doubt largely increase the prime cost. In Burmah it would seem that things are different, for it appears that at Kyouk Phyoo, 40 Rs. (per maund it is presumed) have already been offered for the oil.

The best method of extraction of the oil would be certainly by the hydraulic press. The native mill obtains the oil by friction, which produces heat, and consequently all the resinous matter of the oil is passed out of the seed along with it. The principle of the hydraulic mill is simply pressure without heat. This is the principle applied to the production of what is called "cold drawn" castor-oil. The mill is of very simple construction, consisting simply of a couple of iron plates, one being adjusted over the other. Motion is communicated to one of the plates (either the upper or the under) by animal, water, or steam power. This motion brings the surface of the one plate into direct contact with that of the other, crushing everything between. The ordinary copying press gives a fair idea of the kind of action required. The seed should first be shelled (there are machines for this purpose in good oil mills, but in Burmese prisons this would probably be done by hand) and then placed in a bag on the fixed plate. Care should be taken to spread out the contents of the bag as flatly as pos-

sible. The pressure is then applied and the oil exudes. Several bags may be pressed simultaneously, one being placed over the other with an iron plate of sufficient strength between each. The necessity of flattening out the bags is apparent here, for if this precaution is not adopted, the plates which divide each layer of bags would be apt to bend or break under pressure. The refining process should be conducted in the usual manner in filters of animal charcoal or sand, or both combined.—*Four. of App. Sci.*, Dec. 1, 1879.

DRUG SMOKING.

BY REGINALD E. THOMPSON, M.D.

The following remarks and formulæ are extracted from a paper on "The Therapeutical Value of Drug Smoking," especially in reference to asthma, which appeared in the "Practitioner" for August:

The chief difficulty in treating an individual case of asthma arises from individual peculiarities, which makes the choice of the appropriate neurotic a matter rather of hap-hazard selection, numerous experiments being sometimes necessary before an indication is obtained as to the special drug required; one drug will have a so-called magical effect in one case which may prove inert when used in another, and hence in endeavoring to meet the exigencies of a number of individuals it becomes necessary to combine a number of remedies, and such a combination of drugs becomes more universal in its application in proportion to its complexity, the chance of its proving effectual in any individual case being greatly enhanced by such a composition.

It is a matter of some difficulty to analyze with any certainty those mixtures of vegetable and other substances which are sold as remedies for asthma, but an examination of them shows conclusively that they are composite, different leaves being found on submitting any sample to microscopical analysis; some of them contain opium, others do not; most of them contain lobelia, and it may be stated with some certainty that all of them have stramonium for their basis.

If such remedies are tried in a number of cases it is surprising how one remedy at one time appears to be of the greatest service, another at another time; much depends, doubtless, upon the method of preparation and preservation, and upon the care with which the drugs are selected, and the best secret remedy I know (Himrod's) is evidently

well prepared and preserved, the leaves of which it is composed being fresh and green.

Remedies for asthma are supplied in three forms: a powder which is burnt and the fumes of which are inhaled, cigarettes composed of tobacco combined with various drugs, or of paper dipped in a solution of the drugs.

The best method of preparing the drugs for the powder form of remedy appears to me to be this: the leaves of the vegetables used should be procured in good condition and perfectly fresh; they should then be soaked in a solution of nitre (25 per cent.), and the leaves then dried by gentle heat and powdered. I have made use of the various neurotics in this manner in asthma, first separately, in order to ascertain the individual value of the remedy, and then in combination, and the experiments have now been carried on for many months, and I am disposed to place them in the following order of merit: opium, stramonium, cannabis indica, conium, lobelia.

The three first on the list appear to be the most potent by fumigation, but when administered in the wet method (if I may use the term) cannabis indica is so uncertain and so apt to produce delirium, especially in women, that I prefer conium, a drug from which I have obtained extremely good results when administered by the mouth.

With belladonna I could not satisfy myself that any good results were to be obtained by fumigation, and I consider it far inferior to those given above in whatever way it is administered.

The powder may be used by those patients who are not accustomed or object to smoking cigarettes, or it may be added to the tobacco of those who prefer the use of the pipe.

As regards the composition of the powder, I have had good results from gr. ix of stramonium and gr. i of cannabis indica, this being a quantity which will cover a shilling, sufficient for one fumigation.

But if the patient does not object to smoking, I much prefer to administer the remedies in the form described in my previous paper, namely paper cigarettes impregnated with tinctures so that the dose may be accurately apportioned.

It will be understood that in suggesting remedies which serve to alleviate the spasmodic dyspnoea of asthma I do not consider that they constitute a mode of treatment calculated to improve the general condition of the patient, or that they are more than palliatives of an urgent

symptom: constitutional treatment by ferruginous tonics and cod-liver oil, or it may be by iodide of potassium or arsenic, must be resorted to, if it be intended to give the asthmatic patient permanent relief from distressing disease. With acute conditions of the disease, with bronchial complications of such a nature as to contra-indicate the use of iron, there is probably no treatment better for a majority of cases than the use of iodide of potassium with stramonium; in many cases of like character I have derived very good results from the administration of hemlock in combination with the hypophosphite of soda, but for the prevention of the disease I know no treatment to compare with iron and cod-liver oil.

But for soothing and diminishing the dyspnœa, neurotics may be used with great effect, and the following combination is that which, up to this time, has given me the best results.

The same form of cigarette is used as described in my former contribution on this subject, and the paper is soaked in the following drugs according to the recipe here given:

Extract of opium,	gr. $\frac{1}{4}$
Extract of stramonium,	gr. $\frac{1}{32}$
Tincture of Indian hemp,	℥ $\frac{1}{2}$
Tincture of hemlock,	℥ $1\frac{3}{4}$
Tincture of lobelia,	℥ $1\frac{3}{4}$
Tincture of tobacco,	℥ 9
Oil of anise,	℥ $\frac{1}{8}$
Nitre,	gr. $\frac{1}{4}$

Or for a sheet of Swedish paper sufficient to make sixty-four cigarettes the formula may be given thus:

Tincturæ tabaci,	3 x.
Tincturæ conii,	3 ii.
Tincturæ lobeliæ,	3 ii.
Tincturæ cannabis Ind,	℥ xxxii.
Extract. opii,	gr. i.
Extract. stramonii,	gr. ii.
Olei anisi,	℥ viii.
Potassæ nitratis,	gr. xvi.
Spir. v. r.,	ad 3 iiss.

This formula, which is a complex one, has only been obtained from repeated experiments, leading step by step to the addition of some effective remedy, and to the elimination of less effectual drugs.

As it is sometimes desirable not to give opium or Indian hemp, I

have had cigarettes made with stramonium and lobelia only ; so that altogether I have three different kinds for use : opium cigarettes, containing a small quantity of opium and stramonium ; a compound opiated cigarette, containing the drugs given in the formula above, and a stramonium cigarette without opium.—*Pharm. Jour.*, Nov. 15, 1879.

TINCTURE of QUILLAIA as an EMULSIFYING AGENT.

BY HENRY COLLIER, Teacher of Pharmacy at Guy's Hospital.

Read before the British Pharmaceutical Conference.

I now pass on to a consideration of the use of a tincture of the bark of *Quillaia saponaria* for the preparation of emulsions. The tincture which has been employed in the preparation of the various mixtures upon the table has been made according to the following formula, which is taken from Guy's Hospital Pharmacopœia:

Quillaia bark, in coarse powder,	. . . . .	4 oz.
Rectified spirit of wine,	. . . . .	1 pint.

Digest for three days, and then strain.

The bark before powdering is carefully freed from all remains of outside layer, and the tincture produced is of a pale yellow color.

Into this bottle I have put some mercury, and shaken it up with tincture of quillaia. The result is that the mercury has been reduced to a very fine state of division. It has very much the appearance of hyd. c. creta, and examined with a lens it is seen to be composed of distinct globules of mercury. So long as there is some tincture present this division of the metal remains; if it be dried, it at once runs together and appears in its ordinary liquid state. This is a remarkable power which tinct. quillaie possesses of destroying the cohesion between the globules of mercury, breaking them up and preventing them from uniting together; and it is this property which renders it so valuable an emulsifying agent.

A true emulsion consists, as is well known, of a number of oily or resinous particles floating about in a watery liquid by means of some agent which prevents them from cohering. To be perfect, the emulsion should have a milky appearance, and the suspended particles should not subside or rise too rapidly. In the British Pharmacopœia there is a preparation containing mercury in a very fine state of division, and which is, in fact, an emulsion containing mercury finely divided. The

This forms an excellent emulsion, and with the addition of syrup. zingiberis, ʒss, constitutes the Mistura Filicis Maris of Guy's Hospital.

Copaibæ,	.	.	.	.	.	.	ʒss
Tinct. quillaiaë,	.	.	.	.	.	.	ʒss
Aq. destil,	.	.	.	.	.	ad	ʒi

Misce.

The copaiba in this mixture is perfectly emulsified.

Here is an example of an essential oil:

Ol terebinth.,	.	.	.	.	.	.	℥xx
Tinct. quillaiaë,	.	.	.	.	.	.	℥xx
Aq. destil,	.	.	.	.	.	ad	ʒi

Misce.

This formula, with the addition of tinct. limonis, is the mistura terebinthinæ (Guy's).

I have found that resinous tinctures require more than their bulk of tinct. quillaiaë to prevent any separation of resin.

Tinct. tolut.,	.	.	.	.	.	.	℥40
Tinct. quillaiaë,	.	.	.	.	.	.	ʒi
Aq. destil,	.	.	.	.	.	ad	ʒi

Misce.

The resin deposits after some time, but upon shaking it is easily diffused.

This mixture contains the soluble matter of 12 grains of guaiacum resin in every fluidounce, so that it is about the same strength as mist. guaiaci., B. P. The following is the formula:

Resin. guaiaci,	.	.	.	.	.	.	gr. xii
Tinct. quillaiaë,	.	.	.	.	.	.	ʒi
Aq. destil,	.	.	.	.	.	ad	ʒi

Dissolve the guaiacum in the tincture, filter, and then mix with the water.

Resin of copaiba is largely used at Guy's Hospital, where it is considered a valuable diuretic. It does not appear to me to make so perfect a mixture with tinct. quillaiaë as the Hospital formula with pulv. tragacanth co. The liquid is not thick enough to prevent the resin separating too rapidly. Here are mixtures of copaiba resin made after the following formulas:

Mist. Resinæ Copaibæ (Guy's).

Resin of copaiba,	.	.	.	.	.	.	15 grains
Rectified spt. of wine,	.	.	.	.	.	.	20 minims
Compound powder of tragacanth,	.	.	.	.	.	.	15 grains
Syrup of ginger,	.	.	.	.	.	.	1 fl. dr.
Distilled water to	.	.	.	.	.	.	1 fl. oz.

Misce.

The resin and spirit are put into an evaporating dish and blended together by heating over a water-bath, then poured into a mortar containing the pulv. tragacanth. co., previously made into a thick mucilage with a little of the water, and rubbed well together, the syrup and the remainder of the water being gradually added.

Resinæ copaibæ,	gr. xv
Tinct. quillaæ,	ʒi
Aq. destillat.,	ad ʒi

The resin is dissolved in the tincture, and the water gradually added with agitation.

Bals. Peru,	℥xv
Tinct. quillaæ,	ʒi
Aq. destil.,	ad ʒi

This mixture is open to the same objection—the balsam subsides too rapidly. The above quantity of balsam, with gr. xv of pulv. tragacanth. co., gives an excellent result.—*Pharm. Journ. and Trans.* Sept. 20, 1879.

THE POLARIMETER AND ITS USE IN PHARMACY.

BY CHARLES SYMES, PH.D.

Read before the British Pharmaceutical Conference.

For the development and perfecting of the science and practice of pharmacy various instruments and forms of apparatus have, from time to time, been introduced. It is not, however, to a new instrument that I am desirous of directing your attention, but to one which, although it came into existence some sixty years ago, has not in this country and in recent times received the amount of attention which it appears to me to merit, nor has it been applied to many purposes for which it seems calculated to be of use.

In its variously modified forms it is known as the polariscope, saccharimeter, polaristrobometer and polarimeter, men of science and manufacturers having progressively introduced such alterations as appeared desirable for the better accomplishment of the object aimed at, viz., polarizing a ray of light and accurately measuring the amount of rotation produced in that ray when it is passed through an optically active liquid or liquid possessing rotatory power. My chief aim in bringing this subject before the members of the Conference is to offer for their consideration some of my experience, and to render familiar, as far as I am capable of so doing, this instrument which has hitherto been dealt with chiefly in works of a purely scientific character, and which has been regarded by the working pharmacist as outside his province, and useful only in the prosecution of abstract science. That too little is known of its general application has long been my opinion; but this was brought more forcibly to my mind in June of last year, when (in company with Mr. Greenish) I paid a short visit to M. Petit, of Paris, and found him using the instrument of

Laurent practically in his business for determining the purity of certain alkaloids, etc., and was assured by him that the results obtained were as trustworthy as those of the most accurate chemical analysis. To accomplish the object already mentioned and render the subject thoroughly clear to those who have not previously given any attention to it, I may be allowed to say a few words on polarized light.

A ray of common light, as you will be aware, is assumed to consist of vibrations in the ethereal medium or luminiferous ether, occurring in two directions at right angles to each other, and by interference the primary planes are constantly shifting. If, however, these two vibrations are split up by the absorption, reflection or dispersion of one, or by refraction of both, the remaining portion, or one of the portions separated, constitutes a ray of polarized light, and as the phenomenon of interference ceases it vibrates in one plane only. If, now, this is made to traverse certain media, the plane no longer remains in this direction, but is deviated either to the right or left, and is caused to rotate or assume a spiral form, and it is, as already stated, for the measurement of the amount of rotation caused by different fluids when so traversed that the polarimeter has been constructed.

The property possessed by quartz of circularly polarizing a ray of light was known to Sebeck and Arago, but it is to Biot, in 1818, that we owe the discovery of the property possessed by many fluids of rotating a ray of plane polarized light. He states that this occurred to him accidentally whilst examining crystallized laminæ, placed in highly refractive media, such as oil of turpentine. He thoroughly investigated the phenomenon, and laid the foundation of a very important study, his early results being obtained by means of an instrument devised by himself, not unlike the polariscope attached to the microscope, except that the polarization was obtained by reflection from a blackened mirror, and that the analyzer was placed in the centre of a graduated disc. When the analyzing prism was so placed as to obscure the polarized ray, on interposing a tube containing an active fluid the light was again found to pass until the analyzer had been rotated through a certain number of degrees, that number being taken as the rotatory power of the fluid; but it was found difficult to determine the exact point of maximum darkness, and somewhat wide and inaccurate results were obtained. M. Soleil, an instrument maker of Paris, next constructed with considerable ingenuity and skill an improved form, by the use of which much greater accuracy could be obtained. In it the light first passes through a double refracting prism as analyzer, then through a plate of quartz 3.75 mm. thick (subsequently replaced by a double plate), then through the fluid under examination, another plate of quartz, the compensator consisting of two wedges of quartz, and finally through the analyzer. To this there was added what Soleil called a *produce of sensible tints*, consisting of a prism, Galileo telescope and quartz plate. On one occasion I spent a profitable hour or two in thoroughly examining this instrument, taking it to pieces and tracing the tortuous course of a ray of light through it. The study was interesting as showing what optical skill can accomplish and what complicated means had here been employed to surmount difficulties, which have since been overcome in a more simple manner. The special features in this instrument are first, that the ray of polarized light emerging in a vertical plane from the prism meets the double plate of quartz, one-half of which rotates to the right,

the other half to the left, the rotation being sufficiently great (90°) to decompose the ray and to produce a rose-violet tint uniformly over the whole field. This is known as the sensitive or transition tint, also the tint of passage. Secondly, the analyzer is fixed with its axis corresponding to that of the polarizer, the amount of rotation produced being measured by compensation, effected by a plate of quartz divided into two wedges, and fitted with rack and pinion motion, by which they are moved over each other so as to increase or diminish the thickness; they are also attached to a vernier and scale. When the compensator is at zero the whole of the disc is rose-violet, but the introduction of an active fluid causes one-half to become red. The compensator is then moved through a sufficient number of degrees to restore uniformity, and the amount of rotation is thus ascertained. Actual degrees are not marked in the scale, but the rotation produced by a plate of quartz 1 mm. thick, equal to that given by 200 mm. of solution of sucrose (16.19 grams in 100 cc. of water), being marked on the scale and divided into 100 equal parts.

The instrument was specially constructed with a view to its use for sugar solutions and is best known as Soleil's saccharimeter, of which there are several modifications, such as the Soleil-Ventzke, Soleil-Scheibler, etc.

Accurate as were the results obtained by this means, there were some difficulties, such as the interference of colored solutions with the sensitive tint, the shortness of the scale, etc., which have caused it to be superseded by more simple forms in which, as in Bior's instrument, the analyzer is made to rotate, and these forms have been adopted by two opticians Duboscq and Laurent, who may be regarded as the successors of Soleil.

In 1860, Professor Jellett, of Dublin, described to the British Association at Oxford, a new analyzing prism, which he had invented, by which greater accuracy could be obtained than by any previous arrangement. The report is as follows: "Professor Jellett described to the section a new analyzing prism, by which the plane of polarization of polarized light may be determined with great precision. This instrument consists of a large prism of calc-spar, which is reduced to the form of a right prism by grinding off its ends, and sliced lengthwise by a plane, nearly, but not quite perpendicular to its principal plane. The parts into which the prism is thus divided are joined in reversed positions and a diaphragm with a circular opening is placed at each end. The light which passes through both diaphragms produces a circular field, divided by a diametrical slit into two parts, in which the planes of polarization are slightly inclined to each other. If then light, which has been previously polarized, be transmitted, it will be extinguished in the two parts of the field of view in positions which lie close together, and the light will become uniform in a position midway between these. This position determines the plane in which the incident light was polarized with a precision much greater than has been otherwise attained. Professor Jellett stated that the different observations did not differ from one another by an angle greater than a minute, and that the instrument was equally applicable to the case of homogeneous light."

The first practical application of this invention was in the construction of a polarimeter for the Professor by Bryson in that year, and the manufacture is continued by the same optician at the present time; it is the most simple form with

which I am acquainted, efficient and inexpensive; it is the instrument now before you, the one with which my observations have been made, and which I have compared with those of Wild, Laurent and Duboseq, with very satisfactory results. The instruments of the last named maker still retains the double quartz plate of Soleil, but dispenses with the compensator, having been fitted with a Jellett's prism as analyzer on a suggestion made by him in 1869.

That of Laurent has as its special feature the polarized ray passed through a diaphragm with circular opening, one half of which is covered by a plate of quartz, the division of the field by this means giving great precision to the readings; the analyzer is an ordinary Nicol's prism. By this means the optical work is simplified as compared with the old form and the perfection of working is enhanced. Wild's polaristrobometer, manufactured by Hermann and Pfister, of Berne, is a special form of the instrument. It is somewhat elaborate in construction; the readings are taken at the disappearance from the centre of the field of certain lines or bands which cross it and which are produced by two plates of calc spar crossed at right angles to their principal faces. Those who work with this instrument speak of it as giving very satisfactory results. In 1872, Professor Jellett, in a paper read before the Royal Irish Academy, described a "new optical saccharometer," an ingenious arrangement by which the polarized ray is made to traverse a fluid, the rotatory power of which is previously determined and which is opposite in character to that of the fluid to be examined. In general terms it might be described as an instrument by means of which the relative rotatory power of any transparent fluid to that of a standard fluid may be accurately determined. Although delicate in its results it is somewhat troublesome in working and does not appear to have come into general use.

Originally, ordinary daylight, or that from an Argand lamp was used; but on discarding the more complicated instrument of Soleil, with its compensator, whereby the decomposition of the light due to the unequal refrangibility of the different rays was overcome, monochromatic light was adopted. Different operators, however, used different colored rays with, as a matter of course, different results; hence it became necessary when stating the rotatory power of a body to indicate by what ray the reading was taken, and this still obtains to a large extent; thus, in the "Agenda du Chimiste" last year there are four tables giving the rotatory power of 76 bodies—12 by the "*teinte du passage*," 7 by the red ray, 10 by the yellow and 20 without any indication as to the ray, and the remainder indicated by letters corresponding to certain Fraunhofer lines, as used by the authorities from whom the results are quoted. It is true, we have a factor, .767, by which to multiply the values obtained by the yellow ray to convert them into those which could be obtained by the red, but it has been shown that this is not constant for all bodies. Further, one object of a table is to show at a glance without calculation the relative rotatory power of different bodies; now this clearly cannot be the case with such tables as those referred to. This chaotic state of things is to some extent in process of rectification, and modern instruments are all constructed with a special view to their use with the yellow flame, corresponding to the line D of the spectrum, or, in other words, with a Bunsen flame containing a salt of sodium. This gives a grey field

quite as sensitive as the transition tint, and where observations are continued for any length of time it is far less fatiguing to the eye of the observer.

Certain natural crystals possess high rotatory power. Thus a plate of quartz 3.75 mm. in thickness gives a rotation of 90° , whilst a column of English oil of turpentine, 100 mm. in length, gives only $14^\circ.30'$. Some few salts, such as bromate and chlorate of sodium, acetourate of sodium, and hyposulphite of lead possess double rotatory power; but most inorganic salts, and some liquids, such as water, alcohol, ether and chloroform, are inactive. The activity in crystals and liquids depends on different causes, the former belongs to the domain of physics, the latter to that of chemistry, and it is this, viz.: the molecular rotatory power, which we are more especially considering. The rotation produced by any given liquid (all else being equal) depends on the length of the column; it will be evident therefore that to have uniformly correct results the greatest accuracy must be observed in this respect, and that either the same length of tube must always be used or the readings must be brought to the same standard by calculation. The usual working length is 200 mm., but most operators supply themselves with tubes of 100, 50 and even 25 mm., as some of the fluids to be operated on possess so much color that light will not pass through a larger column satisfactorily. It is desirable to use the larger tube whenever available, inasmuch as the error will be thereby diminished; but whatever be the dimensions of the tube used the results should be stated in terms corresponding to a column of fluid 100 mm. in length, this now being generally accepted, and $[a]$ is used to indicate the molecularly rotatory power of such a column. Hesse, however ("Chem. Centr.," 1875, 369, "Jour. Chem. Soc., 1876, 667), in referring to the results obtained by De Montgolfier, Weiss and Biot, points out the difference obtained by the ray D, the red and transition tints, and concludes that this symbol is equivocal, and suggests that it is better to use a_D for the rotatory power obtained by the yellow ray, as has indeed been the practice for some time in Germany.

When the transition tint was almost exclusively adopted the sign $[a]$ was used to indicate the rotatory power read by it, otherwise it would have been more simple to have adopted this sign where the sodium ray was used, and to have used the qualifying letter only when other rays were employed, which is now rarely done.

Temperature influences the rotatory power to some extent, 15.5°C (60°F .) being that at which readings are usually taken, and it has been found that the rotation decreases as the temperature increases, and *vice versa*; but Landolt has shown that the diminution is not always uniform at all temperatures for the same body, or equal for all bodies. He gives as examples:

Oil of Turpentine $[a]_D$ $36^\circ.61'$: diminished rotatory power for an increase of $1^\circ\text{C} = .004437$.

Oil of Orange $[a]_D$ $115^\circ.31'$: diminished rotatory power for an increase of $1^\circ\text{C} = .12371$.

This diminution being represented graphically, not by a straight, but by a slightly curved line. This, I think, would depend entirely on the expansion and rate of expansion of the liquid, inasmuch as an increase of temperature would necessarily increase the volume and reduce the number of molecules in a column of a given length. The slight expansion of the tube would tend in some degree to compensate

for this, and in most fluids the difference for two or three degrees of temperature is so slight that it might be disregarded as being less than the probable error of observation.

Magnetism, also, influences rotation; indeed, some bodies which are void of this property under ordinary circumstances, will under its influence exercise it in a marked degree. The discovery of this phenomenon we owe to Faraday ("Phil. Trans.," 1846, p. 1), and it has been further investigated by De La Rive ("Archives des Sciences," etc., vol. xxxii, p. 193; "Annales de Chimie," 4th series, vol. xv, p. 57; "Phil. Mag.," 4th series, vol. xl, p. 393). This is, however, a study in itself, and those who wish to prosecute it will find abundant matter of interest in the papers quoted; suffice it to say, that under the influence of magnetism the same law holds good as regards decreased rotation for increased temperature.

The advantage of having certain commonly occurring liquids, such as those mentioned, void of activity is obvious, as it enables us to make concentrated solutions of most solid substances, such as sugar, camphor, the alkaloids, etc., and to select a menstruum in which the body is most soluble, since *concentrated* solutions are most desirable, inasmuch as the calculation is made for the solid substances, and any error in observation will be increased in proportion to the dilution. Not only so, but it has been shown by Landolt ("Deut. Chem. Ges. Ber.," [9], 901-904) that to obtain accurate results *saturated* solutions are absolutely necessary, for as in the case of temperature so in dilution, the effect cannot be represented graphically by a straight line. In concentrated solutions the divergence is only a few tenths of a degree, and the rotatory power of the body remains the same whatever be the (inactive) solvent employed; but observations taken with dilute solutions are utterly worthless. He further finds (Liebig's "Annalen," clxxxix, 241-337) that some substances have an increased proportional rotation by dilution, whilst others are diminished; turpentine and ethyl tartrate always show increase, nicotin and camphor both show diminution, and these results are constant with all solvents.

Organic liquids and solutions are sometimes so much colored that light will not pass through even 25 mm. sufficiently for our purpose. In such cases filtration through charcoal is usually resorted to; this, under ordinary circumstances, removes enough of the color to admit of the observation being made, or indeed sometimes entirely decolorizes. But this procedure introduces a possible source of error, inasmuch as it has been shown by Dr. Stammer ("American Chemist," from the Sugar Cane, "Pharm. Journ." [3], vol. i, p. 926) that in the case of saccharine solutions the char absorbs sugar from the first portion of the liquid, which passes through and so reduces the strength and rotatory power. This would doubtless occur equally with solutions containing alkaloidal bodies, and possibly some others; but as the char becomes saturated before it loses its decolorizing property, if a sufficient quantity be passed through, and the latter portion be taken for examination, the chance of error on this point is obviated.

The great commercial industry in which the polarimeter has been most useful is the sugar trade, and as the expenditure of large sums of money is not unfrequently dependent on the results so obtained, it is not surprising that the greatest perfection

in construction and working has been sought for its special requirements.¹ There is, however, good reason to believe that of the other spheres of usefulness as yet unknown (in addition to those which are known) some are closely allied, whilst others belong to the domain of pharmacy. By its means (as already stated) the purity of the alkaloids can be readily determined; castor oil, croton oil, and doubtless some others of this class possess their specific rotatory powers, whilst the majority of essential oils do so in a high degree. Landolt, who has worked largely with bodies of a definite and constant chemical constitution, does not appear to have as much faith in its application to essential oils on account of some amount of variation dependent on soil, climate, etc., and in his recently published memoir he devotes but little space and consideration to them.

Oil of turpentine and other volatile oils were, however, amongst the first liquids examined in this way, and connected with which an interesting incident occurred. Biot, in announcing his discovery in 1818, called special attention to the fact that whilst in quartz or rock crystal there existed two opposite directions of rotation, in oil of turpentine the rotation was in one direction only, viz., from the right to the left of the observer, and this was the same in direction, although slightly different in degree for all samples examined. This statement remained unchallenged until 1843, when Dr. Leeson read a paper before the Chemical Society of London, entitled "Observations on the Circular Polarization of Light by transmission through Fluids." In this paper he stated that every sample of oil of turpentine which had been examined possessed a *right handed* rotation coinciding in direction with that produced by essence of lemon. These conclusions were so thoroughly opposed to those of Biot, that Dr. Pereira undertook to further investigate the subject, and by procuring reliable samples of French oil of turpentine from M. Guibourt, of Paris, he was enabled to demonstrate the fact that both observers were correct; that the French oil rotated to the left, the English or American to the right, and that a mixture of the two in proper proportions possessed no rotatory power whatever ("Pharm. Jour.," [1], vol. v., p. 67).

My first experience in the use of the polarimeter was in a direction not altogether pharmaceutical, but one which nevertheless merits attention from pharmacists, viz., in the examination of urine; it is a legitimate branch of our calling and one which medical men are usually willing to delegate to us; it possesses considerable interest and the remuneration is not influenced by unfair competition on the part of uneducated outside traders. It was diabetic urine containing in round numbers only 2 grains sugar per ounce; subsequently other experiments were made with samples containing larger quantities, but my experience led me to the conclusion that this method of determination is more troublesome and not more accurate than the copper test of Fehling or the recent one of Pavy, although its use has been recommended by Méhu and others. Passing on to essential oils, the work became interesting, although occasionally disappointing; for example, essential oil of bitter almonds distilled in this country, that from abroad which is often obtained from a

¹ Those who are interested in the various kinds of sugar will do well to peruse an excellent paper by Dr. O. Hesse, "The Behavior of Solutions of some Substances to Polarized Light," ("Pharm. Jour.," 3d series, vol. vii, pp 181, 470 and 473.)

mixture of peach kernels and almonds, and the artificial, or oil of mirbane, are all optically inactive, hence the polarimeter does not furnish us with a means of distinguishing between them. Other results were very satisfactory. Thus, finest imported otto of rose is levogyrate, giving a rotation of -3.52° . A common quality was found to be dextrogyrate giving $+1.50^{\circ}$. Now the lower qualities of otto are known to contain varying proportions of oil of geranium; but on examining the only sample of this oil which was then at my disposal and which had been received from the south of France, it was found to give -6.73° . This, then, could not have been the article used in adulterating the sample in question; but subsequently on examining the Turkey oil of geranium a solution of the problem was furnished, since it gave a rotation of $+1.72^{\circ}$ and indicated that it constituted the bulk of the so-called common otto of rose. It was found too that otto of rose distilled in this country possessed an opposite rotatory power to that of the finest imported, as indicated in the table appended to this paper. On examining many samples of oil of lavender it was found that some of the commoner were adulterated with turpentine, and there was no difficulty in determining whether this had been done in France or England, on account of the different rotatory powers of the turpentines in the two countries. Whilst prosecuting this study my attention was directed to an excellent paper by Dr. J. H. Gladstone on essential oils ("Jour. Chem. Soc.," new series, vol. ii, p. 1), in which he gives the specific gravity, rotatory power and refractive indices of a number of essential oils; also to a less important paper by Dr. Julius Maier, of New York, "Detection of the Adulteration of Essential Oils with Oil of Turpentine" ("Chem. News," vol. xi, p. 301, from the "Amer. Jour. Sci.," xxxix, p. 273). Since the publication of these, some oils have come into use which were then less known than at the present time, and some others are now supplied from different localities; it was therefore thought desirable to go over the ground anew and compile a table giving the rotatory power and specific gravity of a somewhat larger number. Such a table is appended to this paper, the samples of oil operated on being the most reliable I could obtain, except where a second quality is mentioned for comparison, and all that were sufficiently colorless to be viewed through a column of 200 mm. were so examined. Some oils, such as those of hops, cassia, chamomiles, myrtle, etc., could only be read through 100 mm.; whilst some such as patchouli and cajuput, admitted only sufficient light through 50 mm. All have been calculated to 100 mm. and at a temperature of 15.5°C . Many results were obtained which being unimportant are not here recorded, but all tended to experience, and as deductions from which might be mentioned that turbidity even though very slight, materially interferes with the accuracy and sharpness of the readings; it is therefore necessary to filter any oils or solutions which are not perfectly bright. Age does not influence to any extent the optical activity of essential oils. Oil of cloves, new and colorless, and samples of a light sherry and dark sherry color all registered very nearly the same, and samples of English oil of lavender less than a year, four years and five years old differed from each other less than one degree.

The *modus operandi* is exceedingly simple. A correct zero must be first obtained thus—one of the tubes being filled with distilled water, the glass disc is slid on so

as to exclude air bubbles, and screwed firmly down. It is then placed in position and the instrument brought opposite to a sodium flame; the operation must be conducted in a dark room, or a black covering cloth be used. The analyser is then set so that the arrowhead on the vernier points to 0 on the scale when the whole of the disc is at a maximum of obscurity, *i.e.*, both halves equally obscure; it is necessary to take several readings of this and note down the results, taking the mean of the observations, and if, as sometimes happens, there is any difficulty in getting an exact zero it is convenient to make a note of the error and add or subtract this from the subsequent readings.

If now the tube be replaced by one containing an optically active liquid, it will be found that the field is entirely illuminated, or that one-half is so whilst the other is obscure. The analyzer is then rotated until equal obscurity is regained and the number of degrees, minutes or decimal parts of a degree, through which it has been moved, as well as the direction, is noted. For each of the following results ten readings were taken; two of these (the highest and the lowest) were struck out, and the sum of the others divided by 8 gave the mean reading, or where the 200 mm. tube was used, division by 16 gave at once the correct mean for 100 mm. It is, of course, necessary from time to time to check the accuracy of the zero, just as a careful dispenser does the correctness of his scales.

With solid substances, a saturated solution being made in water or other suitable inactive liquid, the specific rotatory power $[a]$ is found by dividing the amount of observed rotation a , by the length of the column in decimeters l , by the weight of the active body in each unit of liquid w , and by the density of the solution d , thus

$$[a] = \frac{a}{l \times w \times d} =$$

For the loan of authentic specimens of some of the following oils I have to thank Mr. E. M. Holmes, Curator of the Pharmaceutical Society's Museum.

Specific Gravity and Rotatory Power of Essential Oils.

OIL OF	[a] _D =100 mm. 15.56°C.	Sp. gr.	Rot. p.
Anise	Pimpinella Anisum	0.936+	1°00
Do.	Illicium Anisatum	0.980—	0°82
Ajowan	Ptychotis Ajowan	0.919	0
Angelica	Archangelica officinalis	0.897+	1°78
Almond, Eng.	Amygdalus communis	1.049	0
Do. Foreign	Do.	? 1.063	0
Do. Artificial	Mirbane	1.152	0
Amber	Succinum	0.859+	0°85
Bay	Laurus Nobilis	0.904—	18°88
Bergamotte	Citrus Limetta	0.872+	31°25
Birch	Betula alba	0.872+	2°18
Canada Balsam	Abies Balsamea	0.914—	30°07
Clove Bark	Dicypellium Caryophyllatum	1.052—	2°25
Cardamoms	Elettaria Cardamomum	0.976+	14°59
Cedrat	Citrus medica	0.969—	3°00
Cedar, Commercial		0.968—	16°00
Do. Red	Juniperus Virginiana	0.960—	28°75
Caraway	Carum Carui	0.940—	20°68
Cassia, Pure	Cinnamomum aromaticum	1.053—	1°00
Do., Commercial		1.021+	2°02

OIL OF	[a] _D =100 mm. 15°56°C.	Sp. gr.	Rot. p.
Cascarilla	Croton Eleuteria	0·888+	8·65
Chio Turpentine	Pistacia Terebinthus	0·889+	22°55
Cinnamon	Cinnamomum Zeylanicum	1·025	0
Do. Leaf	Do.	1·060	0
Citron	Citrus medica	0·901+	38°31
Cherry Laurel	Lauro-Cerasus	1·046	0
Citronelle	Andropogon Nardus	0·881	0°81
Cloves, Eng.	Caryophyllus aromaticus	1·064+	0°50
Do. Foreign	Do.	1·064+	0°32
Chamomile, Eng.	Anthemis Nobilis	0·906—	0°95
Do. Foreign	Do.	0·910+	6°16
Coriander	Coriandrum sativum	0·876+	10°65
Cummin	Cuminum Cyminum	0·933+	4°29
Cajuput	Melaleuca minor	0·924—	1°52
Cubebs	Piper Cubeba	0·924—	29°07
Copaiba, New	Copaifera multijuga	0·920—	13°50
Do. Old	Do.	0·920—	12°52
Camphor	Dryobalanops aromatica	0·956+	7°87
Dill	Anethum graveolens	0·860—	6°24
Elemi	Canarium commune	0·867—	3°65
Eucalyptus	Eucalyptus Globulus	0·881—	36°30
Do.	E. Amygdala, odorata	0·912—	42°33
Erigeron	Erigeron Canadense	0·885+	72°41
Fennel	Fœniculum dulce	0·998+	25°71
Geranium, French	Pelargonium species	0·906—	6°73
Do. Turkey	Andropogon Schœnan.	0·880+	1°72
Do. Indian	Andropogon	0·896	0
Do. Spanish	(Eng. dist.)	0·911—	4°45
Ginger, Jamaica	Do.	0·853—	27°15
Do.	(Distilled Abroad)	0·870—	52°25
Do.	Andr. Schœnanthus	0·907—	65°00
Ginger Grass	Hyssopus officinalis	0·951+	39°65
Hyssop	Humulus Lupulus	1·005—	23°63
Hops	Monarda punctata	0·890+	1°42
Horsemint, Amer.	Juniperus communis	0·934—	0°76
Juniper, English	Pilocarpus pennatifolius	0·882—	5°00
Do. Foreign	Lavandula vera	0·855—	13°71
Jaborandi	Do.	0·879—	4°10
Lavender, Eng., New	Do.	0·887—	8°29
Do. Do. Old	Lavandula Spica	0·903—	8°48
Do. Foreign petal	Citrus Limonum	0·876—	5°93
Do. Do. spike	Do.	0·880+	13°75
Lemons, best Commercial	Do.	0·856+	52°05
Do. extracted by Spirit	Do.	0·852+	57°23
Do. Distilled	Do.	0·848+	22°10
Do. obtained by Sponge Process (Hanbury)	Do.	0·957+	24°26
Limes	Citrus Limetta	0·887—	43°80
Lignum Aloe	Elaphrium species	0·925—	2°45
Mustard	Sinapis nigra	1·000	0
Do. Artificial	Sulphocyanide of Allyl	1·010	0
Myrrh	Balsamodendron Myrrha	0·989—	59°06
Myrtle	Myrtus communis	0·898+	18°79
Myrcia	Myrcia acris	0·939+	6°59
Neroli	Citrus vulgaris, Flowers	0·873+	10°62
Nutmeg	Myristica officinalis	0·988+	24°22

OIL OF		[a] _D =100 mm. 15°56°C.	Sp. gr.	Rot. p.
Olibanum	Boswellia Frereana	—	0·872—	4·61
Origanum Vulgare, true	—	—	0·891—	30·27
Do. Commercial, white	—	—	0·877—	16·20
Do. Commercial, yellow	—	—	0·877—	23·74
Do. Commercial, red	—	—	0·876—	15·15
Oreodaphne Opifera (from British Guiana)	—	—	0·917—	27·56
Orange, Sweet	Essence de Portugal	—	0·848—	16·40
Orange Bitter, Bigarade	—	—	0·856—	2°·30
Do. Bigarade, distilled	—	—	0·850—	3°·10
Patchouli, French	—	—	0·988—	57°·10
Do. Penang	—	—	0·970—	48°·26
Parsley	Petroselinum sativum	—	1·000—	8°·90
Do. Seed	Do.	—	0·945—	14°·75
Pennyroyal, English	Mentha Pulegium	—	0·945—	7°·10
Do. Foreign	—	—	1·019—	8°·30
Do. American	Hedeoma Pulegeioides	—	0·938—	29°·82
Pimento	Eugenia Pimenta	—	1·036—	2°·35
Peppermint, English	Mentha piperita	—	0·912—	21°·23
Do. Foreign	Do.	—	0·924—	7°·49
Do. Japanese	Mentha Canad.?	—	0·880—	21°·81
Petit Grain	Citrus vulgaris, leaves and shoots	—	0·900—	4°·14
Rhodium	Genista Canariensis	—	0·931—	10°·28
Rose Otto (distilled in England)	—	—	0·854—	2°·50
Do. Finest Imported	—	—	0·877—	3°·15
Do. Common	—	—	0·867—	1°·50
Rosemary, English	Rosmarinus officinalis	—	0·881—	16°·47
Do. Foreign	—	—	0·952—	4°·47
Rue	Ruta graveolens	—	0·886—	3°·61
Sassafras (English distilled)	Sassafras officinale	—	1·072—	2°·64
Do. Commercial	Do.	—	1·084—	2°·64
Sandal Wood (Eng. distilled)	Santal. Alb.	—	0·958—	2°·36
Do. Foreign	—	—	0·986—	8°·29
Spearmint, English	Mentha viridis	—	0·950—	30°·28
Solidago Odora, Sweet-scented Golden Rod	—	—	0·912—	10°·53
Savin, English	Juniperus Sabina	—	0·927—	32°·78
Do. Foreign	—	—	0·884—	2°·25
Sweet-flag	Calamus aromat.	—	0·926—	14°·31
Do. Commercial	—	—	0·957—	19°·60
Sage	Salvia officinalis	—	0·925—	12°·23
Silver-fir	Abies pectinata	—	0·864—	14°·18
Scotch-fir	Pinus sylvestris	—	0·886—	9°·78
Tansey	Tanacetum vulgare	—	0·923—	29°·48
Thyme	Thymus vulgare	—	0·891—	10°·60
Turpentine, American	—	—	0·870—	14°·30
Do. French	—	—	0·938—	25°·35
Verbena	Andropogon Citratus	—	0·890—	2°·61
Valerian	Valeriana officinalis	—	0·971—	31·50
Wintergreen	Gaultheria procumbens	—	1·162—	0·81
Wormwood	Artemisia Absinthium	—	0·971—	17°·43
Wormseed	Chenopodium anthelminticum	—	0·941—	8°·53
Ylangylang	—	—	0·956—	20°·10

MINUTES OF THE COLLEGE.

PHILADELPHIA, December 29th, 1879.

A stated meeting of the Philadelphia College of Pharmacy was held this day at the College Hall. Dillwyn Parrish, President, in the chair; fourteen members in attendance.

The minutes of the last meeting were read, and, on motion, adopted.

The minutes of the Board of Trustees, for the previous three months, were read by Thomas S. Wiegand, in the absence of the Secretary of the Board, and, on motion, approved.

Mr. Wiegand stated that the Class of the College, for the present year, numbered 353 students, which is an increase over all previous years.

Mr. Wiegand exhibited the certificate of the Paris Exposition, awarding a medal to the College for its exhibit of American drugs. It was neatly framed, and will be hung in a place assigned to it in the museum.

The silver medal was also exhibited, properly mounted so as to show both sides. *Obverse*, a laureated head, with the inscription, "Republique Francaise." *Reverse*, a winged figure holding a tablet inscribed "College de Pharmacie à Philadelphie." "Exposition Universelle Internationale de Paris, 1878."

The receipt of the medal and certificate is hereby acknowledged with the thanks of the College. Then adjourned.

WILLIAM J. JENKS, *Secretary*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, December 15th, 1879.

In the absence of the President, Mr. W. B. Thompson was called to preside; the minutes of the last meeting were read, and, on motion, approved.

The Actuary read a note from Mr. Jas. F. Magee, lately engaged in manufacturing chemicals in our city, tendering to the college for the use of the library, or such other disposition as might be thought desirable, fifteen volumes of "American Journal of Pharmacy," eight of them bound; eight bound volumes of "Jahresbericht der Chemie," by Liebig & Kopp; three volumes of "Chemical News" (American reprint); one volume "American Chemist;" five volumes of the "Proceedings of the American Pharmaceutical Association."

On motion, the thanks of the College were directed to be returned to Mr. Magee for his acceptable and valuable donation.

Written communications were called for, and in response Mr. R. F. Fairthorne read a paper upon the *preparation of spirit of nitrous ether* (see page 7), which was referred to the Publishing Committee. The paper elicited much remark, and the process was regarded by Profs. Maisch and Remington as a very acceptable improvement, inasmuch as it would enable the apothecary to prepare an article of

constant demand, and have a preparation of a certain definite strength and character. Prof. Maisch hoped that Mr. Fairthorne would extend his experiments so as to ascertain if nitrite of amyl might not also be prepared by a process somewhat similar, as it has been shown that much of the so-called nitrite of amyl was a mixture of many things besides the ether intended; he also pointed out certain precautions which might possibly have to be taken in following the process.

The next paper was by Mr. W. C. Bakes, and read by Prof. Maisch (see page 9). The subject was *Mollisine*, a substitute for vaselin and cosmolin, etc., as a base for ointments. The paper was well received, and, on motion, referred to the Publishing Committee.

Prof. Maisch remarked that last summer he had seen, at Oil City, Pa., the various parts of the process of preparing paraffin and paraffin oils, the former being separated from the latter by congealing it in an apparatus for preparing ice by ammonia and removing the oil by pressure. He thought that if the oily liquid was again exposed to a low temperature and then expressed, a soft paraffin suitable for the purposes of the pharmacist might be obtained. Mr. Thompson stated that he had in his possession a specimen of a purely natural product, which was perfectly transparent, jelly-like and of a dark red color; it was obtained from West Virginia. The researches on the same subject by Dr. A. W. Miller and Mr. J. L. Lemberger were also referred to.

A paper upon the *presence of tannin in gentian root* was read by Prof. Maisch (see page 1), who gave a concise statement of the present state of the discussion, and showed, so far as experiment with gentian root as found in our drug market could determine it, that the various reactions relied upon to prove that tannin did exist in the root, were owing to a pectin compound and gentisic acid, which have somewhat similar reactions with those reagents by which tannin is ordinarily recognized.

Prof. Maisch referred to a prescription calling for sulphate of strychnia, gr. i, to be dissolved in water, fʒii, which had been submitted to three different persons, who found the salt to be not completely soluble in that amount of water. He said that in the preparation of strychnia on a large scale he had found the sulphate to be rather freely soluble in water, but had never determined its exact solubility in water, which was stated by authors to be 1 in 48 or 50 parts. Prof. Remington observed that he had not met with any difficulty in dissolving sulphate of strychnia in a relatively small amount of water; and a member stated that he kept on hand, for convenience in dispensing, a solution of 8 grains of sulphate of strychnia in a fluidounce of water. From these observations it was thought likely that the three samples of sulphate of strychnia consisted to a considerable extent of the alkaloid. It was stated that the sulphate, after having been deprived of water of crystallization, contained fully 10 per cent. of its weight of sulphuric acid.

There being no further business, on motion the meeting adjourned.

THOS. S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

California College of Pharmacy.—The annual commencement was held at Union Hall, San Francisco, on the evening of November 28th, when the following gentlemen received the degree of Graduate in Pharmacy: Adolph Sommer, Jas. McL. Mathewson, Arthur H. H. Smith, Emile C. Mervy, G. G. Burnett, Louis P. Messing, George W. Minor, Frank L. Vreeland. A gold medal was awarded to Mr. Sommer, and a microscope, the second prize, to Mr. Mathewson. The valedictory address was delivered by Prof. W. M. Searby, Ph.G.

Pharmaceutical Society of Great Britain.—At the Pharmaceutical meeting, held December 3d, the stem of the araroba tree, a specimen of the bark of the white quebracho tree, *Aspidosperma quebracho*, and of yellow pareira brava, were exhibited. The session was occupied with discussions on the inspection of apothecaries' weights and measures as directed by a recent law, and a paper on the volumetric estimation of arsenious acid, by W. A. H. Naylor, was accepted as read.

Pharmaceutical Society of New South Wales.—The third annual meeting was held at Sydney, July 11th. The Society has taken steps to secure the passage of an amendment to the medical bill pending before the Legislature, and to introduce a Pharmacy Act at the next session of this body. The retiring members of the council, including the President, F. Senoir, were re-elected.

The Pharmaceutical Society of New Zealand was instituted January 28th, 1879, and has its headquarters at Wellington, with Local Committees in Auckland, Christchurch and Dunedin. At the meeting held October 7th the society had 107 members. A pharmacy bill has been drafted and presented to parliament, and endeavors will be made to have chemistry classes instituted and to have portions of the several provincial botanical gardens set apart for the systematic culture of all plants of importance in medicine. The President is Mr. Chas. D. Barraud.

EDITORIAL DEPARTMENT.

The Property in a Prescription.—In the November number of the "New Orleans Medical and Surgical Journal," we observed an editorial, entitled, "The Doctor *vs.* the Apothecary," in which substitutions by apothecaries, property in prescriptions and counter-prescribing are discussed, and the thorough education of the

apothecary is advocated. The evils complained of, and a number of others, have been repeatedly discussed in this journal, and we are pleased to note that our cotemporary evidently expects increased qualification on the part of the apothecary to result in greater advantages to the physician, than the reuniting of dispensing with prescribing by the physician, which is occasionally advocated in medical journals. At present we wish to call attention only to one of the points mentioned, on which we hold radically different views. We clip from the article in question the following:

"It is time that the physicians of New Orleans were taking action to protect themselves from the impositions of druggists and apothecaries. The knights of the mortar and pestle, instead of attending to their legitimate duties, compounding the prescriptions of physicians and in good faith repeating these only when especially ordered, derive quite a revenue from the sale of repetitions; thus injustice is done the doctors, and the way is paved for weak-minded men and women to become the victims of opium, chloral or alcoholic drunkenness. Is it dealing fair with the physician for the druggist to fill on demand an old prescription ordered for some particular case, but now lauded around and handed about by neighbors who administer the remedy in cases of sickness when the diagnosis is the result of no greater skill than that possessed by an old woman?"

We are convinced that the effort of our cotemporary to prevent the renewal of prescriptions without the written order of the prescriber, will share the fate of others which have been made before. A custom which is followed, not only in the United States, but in all civilized countries, cannot be abrogated by the action of the pharmacists and physicians, even if they could be united in the effort, unless supported by legislative enactments, and we question the success of such a movement, if it were really undertaken. The difficulty lies in the fact that the prescription is regarded as the property of the patient, who has paid for the advice; and although as a rule, it is retained by the apothecary as his guarantee in case of error by the prescriber, a copy of it is usually furnished if demanded. In Europe the original prescriptions are returned with the medicines.

The same subject was recently discussed by Mr. A. Kinninmont before the Glasgow Chemists' and Druggists' Association, who considered the prescription to be by right the patient's, and as to repeats, he thought that if any patient wished to have his prescription renewed again and again, the pharmacist had no right to refuse it, although it might prevent some fees from going to the physician. (See "Pharm. Jour. and Trans.," 1879, Nov. 15th, p. 394.) This address was also referred to by the "Medical Press and Circular." Admitting that occasionally the repetition of prescriptions works disadvantageously, and that in some cases a high-class pharmacist might very properly refuse to continue an endless repetition of doses, the editor declines to encourage for a moment the theory that the right to that repetition is possessed by any one but the patient." The writer concludes by saying: "We fail to understand upon what principle a patient who has paid his fee for advice and a recipe for medicine should be obliged to seek leave from either doctor or dispenser to make unlimited use of the recipe which he has thus purchased, and how-

ever justifiable it might be for the dispenser to retain the original prescription for his own safety, we certainly think he is bound in equity to send to his patient, with the medicine, a true copy, so that the patient may please himself as to when and where he will have a repetition of it compounded." (*Pharm. Jour. and Trans.*, Nov. 22, p. 410.)

We agree with these views as to the right of patients to have a prescription renewed, and that the pharmacist cannot legally refuse such renewal if demanded. But we are also aware that sometimes harm may be done, if a medicine prescribed for one person be used on another occasion of sickness, or by a different patient. The risk of renewal is evidently with the patient, and not with the pharmacist or the physician; but the latter might in a great measure prevent such errors of judgment by cautioning their patients as to the danger of an indiscriminate use of a medicine, of the effects of which, in health or disease, they can have no knowledge.

John Broughton.—Two years ago ("Am. Jour. Phar.," 1878, p. 38) we informed our readers that the well-known quinologist of the Neilgherries cinchona plantations was supposed to have been murdered. We learn from the "Pharmaceutical Journal" (London), 1879, Nov. 22, that according to the "Madras Mail" Mr. Broughton is at present at Colombo. He left Ootacamund somewhat unexpectedly about four years ago, and with the exception of some mysterious rumors, nothing was known as to where he had gone. A correspondent of the "Daily News," referring to the statement of the "Madras Mail," remarks that "it is little to the credit of the Madras Government that the fate of an officer high in their service should be involved in such mystery."

OBITUARY.

ANTOINE BAUDOUIN POGGIALE died at Bellevue, near Paris, on the 26th day of August last. He was born on the Island of Corsica February 9th, 1808, entered a military hospital as a student in pharmacy, and graduated as doctor in medicine in 1833. From 1837 to 1847 he was Professor of Chemistry at Lille, and subsequently chief pharmacist and Professor of Chemistry at the Hospital of Val de Grâce at Paris. He served as pharmacist with the French army in Africa, and in 1858 was promoted to the highest rank in military pharmacy, that of Pharmacist Inspector. Poggiale was elected a member of the French Academy in December, 1856, was for several years President of the Pharmaceutical Society of Paris, and for a long time one of the editors of the "Journal de Pharmacie et de Chimie." His scientific investigations were mostly in chemistry in its application to pharmacy, physiology and hygiene.

CLASS PHILAD'A COLLEGE OF PHARMACY, 1879-80.

JUNIOR CLASS.

<i>Matriculants.</i>	<i>Town or County.</i>	<i>State.</i>	<i>Preceptor.</i>
Adams, C. Franklin,	Philadelphia,	N. J.	G. M. Carlslake.
Aigner, Martin.	Pa.	Pa.	A. W. Miller, M.D.
Baker, Ernest Herbert,	Williamsport,	Pa.	Wm. Bell.
Baugh, Harry Leonard,	Philadelphia,	Pa.	J. T. Shinn.
Baur, Charles,	Terre Haute,	Ind.	J. J. Baur.
Behringer, Albert Christian,	Philadelphia,	Pa.	Russell & Newbourg.
Benton, Wilber Merritt,	Peoria,	Ill.	Singer & Wheeler.
Berube, Louis Napoleon,	Ramey,	Pa.	W. W. Moorhead.
Betts, Samuel Everett,	Wilmington,	Del.	A. P. Blomer.
Beuter, John,	Wheeling,	W. Va.	Logan, List & Co.
Binns, John Pemberton,	Philadelphia,	Pa.	W. R. Warner & Co.
Bird, William Henry,	Danville,	Pa.	J. B. Moore.
Bowman, William Jasper,	Cal.	Cal.	H. Bowman.
Brady, Harry,	Philadelphia,	Pa.	C. Gmelin.
Brown, Peyton Bradley,	Marion,	Ala.	C. B. Ash & Co.
Brown, Frank Wighton,	Philadelphia,	Pa.	S. W. Brown.
Buck, Charles Edward,	Showchegan,	Me.	J. P. Remington.
Bye, Charles Alfred,	Hickory Hill,	Pa.	Jos. M. Fulton.
Cahill, James Edward,	Trenton,	N. J.	J. D. James.
Chapman, Charles Frederick,	North Fairfield,	Ohio.	C. H. Chapman.
Christman, Charles Daniel,	Pennsburg,	Pa.	T. D. Brown.
Clabaugh, Alton,	Altoona,	Pa.	S. M. Sellers.
Clapp, Chambers Brown,	Howard,	Neb.	F. G. Nichols, M.D.
Cook, Wm. Edmund,	New Brunswick,	N. J.	P. J. L. Carberry, M.D.
Cox, Walter Friend,	Lancaster,	Pa.	C. A. Heinitsch.
Cramer, Walter,	Milwaukee,	Wis.	Dr. Axt.
Craythorn, Charles John,	Beverly,	N. J.	A. W. Taylor, M.D.
Cressler, David Winfield,	Chambersburg,	Pa.	C. H. Cressler.
Culler, Frederick Wallace,	New Lisbon,	Ohio.	M. T. Nace.
Davis, John Walheater,	Huntingdon Co.,	Pa.	G. W. Hull.
DeHuy, Bernard Henry,	Cloverport,	Ky.	D. S. Jones.
Demaree, Wm. Lowther,	Newport,	Pa.	B. M. Eby,
Dorner, Emil August,	Philadelphia,	Pa.	L. Wolff.
Douglass, Serrill,	Bristol,	Pa.	H. G. Peters.
Eberly, Frank Hertzler,	Chambersburg,	Pa.	M. B. Mosser.
Englsh, George Hiliard,	Woodbury,	N. J.	J. P. Bolton.
Ely, Theodore Julius,	Girard,	Pa.	B. C. Ely.
Faney, John C.,	Schuylkill Falls,	Pa.	E. S. Beary, M.D.
Faunce, Wm. Henry,	Philadelphia,	Pa.	W. H. Pile & Son.
Faussett, John Dobbins,	Trenton,	N. J.	A. L. Thorn.
Finney, Wm. Henry,	Chambersburg,	Pa.	A. J. Miller.
Forgy, James,	McVeytown,	Pa.	L. Wolff.
Galbreath, Wm. H.,	Chambersburg,	Pa.	Chas. Shivers.
Garver, Charles Krauth,	New Orleans,	La.	J. H. Harte.
Genois, Louis,	Cleveland,	Ohio,	Peter Cruice.
Gustacker, Michael,	Philadelphia,	Pa.	Dr. S. C. Blair.
Goebel, George, Jr.,	Harrisburg,	Pa.	H. A. Borell.
Gorgas, George Albert,	Meppen,	Germany,	H. Mueller.
Graff, Emil George Hermann,	Milton,	Pa.	E. Krause & Bro.
Gray, John Franklin,	Woodbury,	N. J.	Bullock & Crenshaw.
Griscom, William, Jr.,	Philadelphia,	Pa.	J. Wyeth & Bro.
Gute, Frederick William,	Paducah,	Ky.	Thomas R. Coombe.
Haessig, Herman, T.,	Lock Haven,	Pa.	E. W. Herrmann.
Hahn, John Henry,	Paducah,	Ky.	C. W. Seary.
Halloran, Francis Marion,	Philadelphia,	Pa.	Wm. R. Warner & Co
Hallowell, Charles Wesley,	Harrisburg,	Pa.	C. L. Mitchell.
Hamlin, Benj. Baird, Jr.,	Unionville,	Pa.	Wm. Coulter.
Hannigan, Wm. Thomas,	Camden,	N. J.	A. W. Wright.
Hammell, Walter Gunnell,	Goonville,	Mo.	Howard & Smith.
Harper, Harry Winston,	Philadelphia,	Pa.	C. W. Harris.
Harris, Edwin,	Baltimore,	Md.	John Moffet.
Hart, Joseph,	Philadelphia,	Pa.	Dr. Urquhart.
Hartman, Chas. Harvey Shanklin,	Smyrna,	Del.	F. F. Hamilton.
Haynes, Thomas Jerdome,	Philadelphia,	Pa.	E. Herwig.
Herwig, Emil Moser,	Haddonfield,	N. J.	J. A. Braddock.
Hinchman, Walter Lippincott,			

<i>Matriculants.</i>	<i>Town or County.</i>	<i>State.</i>	<i>Preceptor.</i>
Hoge, Joseph Hughes,	Philadelphia,	Pa.	Prof. De Ghent.
Hoke, Willis Andrew,	Martinsburg,	W. Va.	J. L. W. Baker.
Holmes, Marshall Calvin,	Trenton,	N. J.	H. Schaffer.
Howard, Jeddie,	Philadelphia,	Pa.	C. G. Frowert.
Hoyt, Frank Ames,	Norwalk,	Conn.	Geo. I. McKelway.
Hunterson, Charles Bradford,	Camden,	N. J.	W. R. Wilson.
Ihrig, Theodore Edward,	Pittsburg,	Pa.	J. G. Baker.
Jacoby, John Wesley,	West Chester,	Pa.	Thos. G. Pierce.
Johnson, Chester,	Oxford,	N. Y.	L. Dembinski.
Johnson, Frank Lincoln,	Lambertville,	N. J.	Emmor H. Lee.
Jones, James Miles,	Reading,	Pa.	J. H. Stein.
Joy, Charles Lineous,	Ilion,	N. Y.	Ogden & Downs.
Kemble, Wm. Wayne,	Tideoute,	Pa.	C. Kemble.
Kerr, John Henry,	Philadelphia,	Pa.	Adam Frank M.D.
Kirby, Charles Pitman,	Salem,	N. J.	Eakin & Ballinger.
Knowiton, George Harry,	Manchester,	N. H.	Jas Bowker.
Krauter, Charles Henry,	Bridgeton,	N. J.	A. M. Wilson.
Lacy, Wm Reif,	Reading,	Pa.	Remington & Sayre.
Landis, Renfrew,	Lambertville,	N. J.	S. K. Slifer.
Lawall, Edgar Jacob,	Catasauqua,	Pa.	J. S. Lawall.
Leedom, Charles,	Newtown,	Pa.	B. M. Magill.
Liek, Charles Willard,	Clyde,	N. Y.	J. E. Smith.
Linden, Washington Emil,	Cleveland,	Ohio.	H. C. Busch.
Loehle, John Francis,	Lebanon,	Pa.	V. H. Allwein.
Luerssen, Frank,	Philadelphia,	Pa.	Dr. C. Gmelin.
Lyman, David Christopher,	Richmond,	Ky.	Wm. G. White.
Lyon, Lucien Eugene Rosamond,	Columbia,	S. C.	Davidson & Clark.
Madden, Ferdinand Sharp,	Camden,	N. J.	J. D. McFerran.
Manheimer, Edward A.,	Indianapolis,	Md.	E. L. Aughinbaugh.
Manz, Constanz,	Lyons,	Ohio,	L. Manz.
May, Charles Henry,	Piqua,	Pa.	Conrad May.
Mayer, William Christian,	Philadelphia,	Pa.	H. E. Wendel.
McAlister, Alexander,	Camden,	N. J.	R. Shoemaker & Co.
Mecannqn, Clifford,	Wilmington,	Del.	Z. James Bell.
Mengle, Charles William,	New Castle,	Pa.	Dr. J. McKinley.
Merrick, Edwin Augustus,	Philadelphia,	Pa.	Wm. H. Pile & Son.
Metzger, J. B.,	Williamsport,	Pa.	Dr. A. B. Finney.
Meyer, Frank Benjamin,	Renselaer,	Ind.	W. J. Imes.
Miller, Wm. Watson,	Philadelphia,	Pa.	John M Thomas.
Morgan, Frank E.,	Concord,	N. H.	Munro Bond.
Morris, Lemuel Iorwerth,	Eureka,	Kas.	Olney & Morris.
Morrisson, John J.,		England.	E. P. Camp.
Morton, William John,	Allentown,	Pa.	S. S. Bunting.
Mount, Harry S.,		Pa.	Hansell & Bro.
Muldoon, Edward Joseph,	Philadelphia,	Pa.	Roger Keys, M.D.
Murray, Harry,	Philadelphia,	Pa.	B. M. Bethel.
Nagel, Arthur Christian,	Easton,	Pa.	T. H. Potts & Co.
Nairn, Thomas Shields,	Washington,	D. C.	G. I. McKelway.
Nelf, Jacob William,	Philadelphia,	Pa.	A. L. Helmbold.
Pape, William Frederick,	Dayton,	Ohio.	J. W. Dougherty.
Parsons, William Norton,	Philadelphia,	Pa.	A. W. Parsons.
Pechin, Jesse Walton,	Montgomery Co.,	Pa.	J. G. Wells.
Pennock, Levis E.,	Oxford,	Pa.	Geo Cooke.
Perry, Mason George,	Canastota,	N. Y.	G. O. Perry.
Petty, John Watson,		N. C.	W. C. Porter.
Purdy, John Henry,	Moundsville,	W. Va.	S. P. Wright.
Querner, Ernst Amandus,	Philadelphia,	Pa.	E. Querner, M.D.
Ralph, Irene Dupont Hendrickson,	Pristol,	Pa.	H. Pursell, M.D.
Reading, Hiram Craven,	Hatboro,	Pa.	T. E. Conard, M.D.
Reed, David Reynolds,	Wilmington,	Del.	R. H. DeBeust.
Risk, James Boyd,	Baltimore,	Md.	Risk & Bro.
Rixstine, Ambrose Jefferson,	Chester Co.,	Pa.	J. T. White.
Rogers, Caleb Forest,	Philadelphia,	Pa.	Thomas Phillips.
Bogers, Franklin Pierce,	Beverly,	N. J.	H. C. VanMeter.
Roland, George Weidler,	Lewisburgh,	Pa.	C. C. Hughes.
Rowe, Charles Edward,	Tarboro,	N. C.	H. C. Archibald.
San'ee, Elmer Valentine,	Nazareth,	Pa.	R. F. Babb.
Schadt, Allen Moses,	Allentown,	Pa.	Wm. H. Rinker.
Schroeder, George Adolphus,	Cleveland,	Ohio,	A. Mayell.
Scott, Joseph Harry,	Philadelphia,	Pa.	W. E. Krewson.
Seiberlich, Albert,	Philadelphia,	Pa.	G. G. Frowert, M.D.
Shaw, Allen,	Quakertown,	Pa.	R. J. Linderman, M.D.
Shepler, Wilbur Seymour,	Monongahela City,	Pa.	Chas. Oram.
Shewell, Charles Tripler,	Philadelphia,	Pa.	H. C. Watt.
Shengle, Samuel Howard,	Springfield,	Pa.	R. S. White & Co.
Slocum, Frank Leroy,	Fort Atkinson,	Wis.	

<i>Matriculants.</i>	<i>Town or County.</i>	<i>State.</i>	<i>Preceptor.</i>
Smith, Edward W.,	Williamsport,	Pa.	P. W. Bentley.
Spengler, John George,	Dayton,	Ohio.	H. A. Post.
Stahler, Eugene Abraham,	Norristown,	Pa.	Wm. Stahler.
Stallman, Harry Reader,	Chestnut Hill,	Pa.	T. L. Buckman
Stephens, Everard Potter,	Wilmington,	Del.	N. B. Danforth.
Stout, John Harvey,	Milton,	Pa.	A. W. Test.
Strater, Henry Herman,	Cleveland,	Ohio.	Vaupel & Moore.
Swope, James Wills,	Bendersville,	Pa.	H. C. Blair's Sons.
Taylor, John Dalzell,	Vineland,	N. J.	John Bley.
Terry, Keavis Johnston,	Birmingham.	Ala.	S. W. Gillespie.
Test, Henry Smith,	York,	Pa.	I. J. Gaahame.
Thornton, Henry,	Philadelphia,	Pa.	D. L. Stackhouse.
Traub, Charles Godfrey,	Indianapolis,	Ind.	G. F. Traub.
Tyree, Josiah S.,	Staunton,	Va.	W. R. Tyree.
Virden, Edwin,	Wilmington,	Del.	H. E. Ashmead.
Walker, George Allen,	Yardville,	N. J.	A. L. Thorn.
Warner, Wm. Richard, Jr.,	Philadelphia,	Pa.	Wm. R. Warner.
Weaver, Henry Bacon,	Mauricetown,	N. J.	H. C. Blair's Sons.
Weaver, Frank Craven,	Philadelphia,	Pa.	R. Shoemaker & Co.
Weiss, Christian,	Philadelphia,	Pa.	M. J. Cummings, M.D.
Wevill, George Edward,	Philadelphia,	Pa.	A. W. Dnvall.
Wilcox, William	St. Clair,	Pa.	H. P. Carr, M.D.
Williams, Wm. Clark,	Frenchtown,	N. J.	S. Levin Dilks.
Wilgus, Wm. Alcott,	Philadelphia,	Pa.	I. Frank Wilgus
Wilson, Samuel Eston,	Terrell,	Texas.	
Wilson, Matthew James,	Philadelphia,	Pa.	A. Wilson
Winn, Philip James, Jr.,	Fluvianna Co	Va.	
Worthington, Isaac Wilson,			Warrington & Trimble.
Young, W. Chalfant,	New Lisbon.	Ohio.	King & Young.
Zeitler, Edward Alfonzo,		Md.	H. H. Hopkins,

SENIOR CLASS.

Agthe, John Frederick Oscar,	Salem,	N. C.	Wm. Simpson.
Atkinson, Edgar Harrington,	Dover,	Del.	D. F. Burton.
Ballantine, Charles Hamilton,	Philadelphia,	Pa.	E. J. Davidson.
Barrington, Richard Calcott,	Mount Holly,	N. J.	Louls Miller.
Basset, Fenwick Hazeltime,	Salem,	N. J.	Jas. T. Shinn.
Beale, Charles,	Philadelphia,	Pa.	Edmond Beale, M.D.
Belleville, Allen Leslie,	Delaware City,	Del.	H. B. Lippincott.
Bellows, Charles Edward,	Bridgeton,	N. J.	Wm. Noison, M.D.
Bennett, Alexander Ellwell,	Mount Holly,	N. J.	Twining & Schiedt.
Beringer, George Mahlon,	Philadelphia,	Pa.	Bullock & Crenshaw.
Bidwell, Edwin Hugh,	Vineland,	N. J.	H. C. Walker.
Boysen, Edward George,	Buffalo,	N. Y.	Dr. O. Boysen.
Boysen, Lewis Colloredo,	Buffalo,	N. Y.	Dr. O. Boysen.
Brakeley, Philip Fine Howell,	Bordentown,	N. J.	L. Thomas.
Brooks, Mitchell Baxter,	Philadelphia,	Pa.	C. P. Elfreth.
Buchanan, Andrew,			
Burdick, Edwin Raughley,	Milford,	Del.	D. J. Laughlin.
Carslake, Wm. H.,	Alleniown,	N. J.	
Carl, Charles Blair,	Greencastle,	Pa.	Adam Carl.
Clark, Harry Scott,	Lancaster Co.,	Pa.	Chas. H. Clark.
Clark, Robert, Jr.,	Philadelphia,	Pa.	E. J. Davidson.
Clymer, Chas. Wesley,	Philadelphia,	Pa.	Barker, Moore & Mein.
Collier, Lewis Clay,	Kenton,	Ohio.	Dr. J. A. Rogers.
Collins, Thomas S.,	Absocon,	N. J.	D. S. Ferguson.
Colton, George Havens,	Springfield,	Mass.	H. & J. Brewer.
Courtney, Samuel Walter,	Philadelphia,	Pa.	C. M. Schellinger, M.D.
Dahis, George Emil,	Philadelphia,	Pa.	P. M. Kelly.
Daniel, Adam Clarion.	Lykens,	Pa.	A. G. Stanley.
Danner, Wm. Edward,	Bethlehem,	Pa.	J. Wyeth & Co.
Davis, Frank Clifford,	Philadelphia,	Pa.	R. Shoemaker & Co.
Davis, Charles Sumner,	Philadelphia,	Pa.	McKeown, Bower, Ellis & Co.
Detzer, August Jacob,	Fort Wayne,	Ind.	
Diehl, Benjamin Harper,	Quakertown,	Pa.	H. Fisher.
Dockstader, William Crossett,	Dover,	Del.	B. F. Johnson.
Drueding, Frank Frederick,	Cloppenburg,	Germany.	Drueding Bros.
Elkins, Charles William,	Philadelphia,	Pa.	L. F. Segrest.
Evans, George Bryan,	Colmar,	Pa.	G. I. McKelway.
Famous, Parker Hooven,	Dublin,	Md.	James W. Harry.
Ferdinand, George Adam,	Dubuque,	Iowa.	T. W. Ruete.
Fisher, George Washington,	Catawissa,	Pa.	Thomas Hunter, M.D.
Freeman, Oliver John,	Allentown,	Pa.	VanBuskirk & Apple.
Fristy, Frank,	Atchison,	Kas.	Johnson & Sherer.

<i>Matriculants.</i>	<i>Town or County.</i>	<i>State.</i>	<i>Preceptor.</i>
Früh, Gustar Adolph,	Philadelphia,	Pa.	C. D. S. Früh.
Fry, Daniel Joshua,	Vineland,	N. J.	S. Gerhard
Gadd, Samuel Westley,		England.	S. Creadick, M.D.
Galbreath, Thomas Mullin,	Dublin,	Md.	H. C. Blair's Sons.
Garman, Franklin Samuel,	Lykens,	Pa.	J. Garman.
Gibson, Robert, Jr.,	Wheeling,	W. Va.	Logan, List & Co.
Goldsmith, George Washington,	Philadelphir.	Pa.	Wm. Weber.
Gossling, Thomas Richard,	Frankford,	Pa.	J. P. Bolton.
Grime, Robert Thomas,	Jeffersonville,	Pa.	J. P. Bolton.
Hallowell, Jas Alexander Davis,	Trinity Co.,	Cal.	Henry Blithe.
Hano, Simon Louis,	Philadelphia,	Pa.	H. B. Lippincott.
Harker, Frank Scott,	Philadelphia,	Pa.	Remington & Sayre.
Harrison, Francis Edward,	Philadelphia,	Pa.	A. H. Bolton
Hartzell, Alfred Kerr,	Allentown,	Pa.	Dr. H. R. Hartzell & Co.
Hayes, George Washington,	Philadelphia,	Pa.	Frank P. Lins.
Hayhurst, Susan,	Philadelphia,	Pa.	Women's Hospital.
Hertsch, Bernhard August,		Saxony.	R. B. Pierce.
Hoell, Conrad Gabriel,	Camden,	N. J.	T. J. Rowand, M D.
Hoffa, John Wilson,	Harrisburg,	Pa.	C. L. Mitchell.
Holden, Louis Henry,	Alleghany City,	Pa.	E. Holden & Co.
Holzhauser, Wm Christian,	New Castle,	Wis.	Aug. Von Trott.
Jackson, George Henry,	Mahanoy City,	Pa.	A. L. Lumb.
Jacoby, Wm. Oscar,	Quakertown,	Pa.	R. L. Jacoby.
Jenks, Wm. Earl,	Philadelphia,	Pa.	W. J. Jenks.
Jost, Washington William,	Philadelphia,	Pa.	Wm. B. Webb.
Kelly, Irving Washington,	Pemberton,	N. J.	H. A. Borell.
Kern, James Pecor,	Philadelphia,	Pa.	Jones & Shaw.
Kerr, Stirling Jr.,	Philadelphia,	Pa.	C. M. Morrell.
Keys, Thomas Franklin,	Philadelphia,	Pa.	Roger Keys, M. D.
Killingbeck, Wm. John,	Camden,	N. J.	
Klemet, John,	Philadelphia,	Pa.	Wm. Klemet.
Kohlerman, John William,	Wilmington,	Del.	A. Nebeker, M. D.
Lafean, Albert Henry,	York,	Pa.	Remington & Sayre.
Lantz, William Henry,	Bethlehem,	Pa.	E. H. Luckenback.
Latin, George,	Dayton,	Ohio.	Sachs & Pruden.
Lavenson, Isaac,	Pottsville,	Pa.	J. C. Hughes.
Leith, Clinton Hess,	Philadelphia,	Pa.	J. O. Eberhard.
Lewis, Arthur Everett,	Scranton,	Pa.	J. Wyeth & Bro.
Lins, John A.,	Philadelphia,	Pa.	Frank P. Lins.
Loos, Frederick, Jr.,	Chestnut Hill,	Pa.	C. L. Mitchell.
Love, John Henry,	Philadelphia,	Pa.	Hance Bros. & White.
Luethe, Amandus Julius,	Milwaukee,	Wis.	Aug. Von Trott.
McCambridge, John Edmund,	Philadelphia,	Pa.	Wm. R. Warner & Co.
McClintock, Wm. Charles,	Ardmore,	Pa.	I. W. Lutz
McFeeters, Andrew James,	Philadelphia,	Pa.	Wm. R. Warner & Co.
Madison, Joseph Summerfield,	Dunmore,	Pa.	J. A. C. Hanly, M. D.
Mascher, William,	Philadelphia,	Pa.	
Maier, John,	Bridesburg,	Pa.	J. K. Knorr, Jr., M. D.
Marshall, Alfred Stanger,		N. J.	James Van Court.
Marshall, Rush Porter,	Princess Anne,	Md.	M. Kratz.
Matthias, Joseph Ingles,	Philadelphia,	Pa.	Barker, Moore & Mein.
Milby, Arthur Robinson,	Frederica,	Del.	Dr. B. Whiteley.
Miller, William Leland,	St. Louis,	Mo.	H. C. Blair's Sons.
Miller, William Moses,	Bridgeton,	N. J.	H. A. Jordan
Miller, Samuel Warn,	Marietta,	Pa.	Hugh Campbell.
Millington, Joseph Thomas,	St. Clair,	Pa.	A. B. Wenrich.
Moser, John Hendricks,	Philadelphia,	Pa.	John Bley.
Muhlenburg, Harry Melchior,	Philadelphia,	Pa.	Bullock & Crenshaw.
Murray, Bernard James,	Philadelphia,	Pa.	G. V Eddy.
Myers, Charles William,	New Oxford,	Pa.	D. H. Schmidt.
O'Daniel, Andrew Allison,	Oxford,	Pa.	J. F. Hayes.
Ochse, George Henry,	Philadelphia,	Pa.	C. A. Werckshagen.
Ogram, Thomas Edwin,	Media,	Pa.	G. I. McKelway.
Opdyke, William Maxwell,	Philadelphia,	Pa.	W. Opdyke.
Owen, Horace Hildebrand,	York,	Pa.	I. H. Kay
Paxson, Oric Henry, Jr.,	Atg'en,	Pa.	J. A. Parker.
Pechin, Wm. Joseph,	Philadelphia,	Pa.	F. C. Clemson.
Pennypacker, Nathan,	Cambria,	Pa.	Warrington & Trimble.
Peters, Henry Eugene,	Allentown,	Pa.	L. W. Adams.
Pettit, Louis Clark,	New Lisbon,	Ohio.	King & Young.
Poley, Linnaus S.,	Norristown,	Pa.	Dr. F. B. Poley.
Reeve, Walter Sharpless,	Medford,	N. J.	H. P. Thorn.
Reiffuss, Emil Gustav,	Philadelphia,	Pa.	A. R. Lawson.
Reynolds, John Brewster,	Philadelphia,	Pa.	H. Duffield, M. D.
Rinek, Charles A.,	Philadelphia,	Pa.	Howard Patterson, M. D.
Roberts, Charles Haines,	Atlantic City,	N. J.	Wm. Wright.

<i>Matriculants.</i>	<i>Town or County.</i>	<i>State.</i>	<i>Preceptor.</i>
Roche, Edward Manning, Jr.,	Philadelphia,	Pa.	E. M. Roche.
Ross, George Redsecker,	Lebanon,	Pa.	Dr. Geo. Ross & Co.
Salfrank, Charles William,	Philadelphia,	Pa.	I. B. Turner.
Saylor, Albert Reese,	Berks Co.,	Pa.	R. Oppermann.
Schandein, Harry,	Philadelphia,	Pa.	C. L. Mitchell.
Schimminger, George William,	Philadelphia,	Pa.	J. W. Dallam & Co.
Shelly, Jacob,	Mechanicsburg,	Pa.	J. Wyeth & Bro.
Sherk, Harry Huber,	Lebanon,	Pa.	J. A. Armstrong, M. D.
Short, William Huntley,	Ardmore,	Pa.	J. F. Stadelman.
Shull, Silas Henry,	Mansfield,	Ohio.	T. R. Combe.
Slough, Charles Edward,	Allentown,	Pa.	J. R. Landis.
Smedley, Harry Leedom,	Media,	Pa.	Jones & Shaw & B.S.Smedley.
Smith, George Farrar,	Fayetteville,	Tenn.	C. W. Smith.
Smith, William Harrold,	Philadelphia,	Pa.	Jos. P. Remington.
Smith, Edward Newton,	Thompsonville,	Conn.	W. A. Campbell.
Sombart, John Edward,	Boonville,	Mo.	E. Roeschel.
Speakman, William E.,	Woodbury,	N. J.	Bullock & Crenshaw.
Stamp, James Edward,	Wilmington,	Del.	J. J. Gallagher & Co.
Stathem, Beach Jones,		N. J.	Dr. J. M. Higgins.
Steltzer, Lewis Joseph,	Philadclphia,	Pa.	H. P. John.
Stout, Charles Pettit,	Florence Heights,	N. J.	Leidy Seipel.
Strunk, Samuel William,	Quakertown,	Pa.	Wm M. Bowen.
Swayne, Walter Scott,	Philadelphia,	Pa.	Jones & Shaw.
Tag, William,	Philadelphia,	Pa.	L. P. Reiman.
Talbot, Stephen Liversidge,	Boston,	Mass.	J. P. Remington.
Thornley, William James,	Norristown,	Pa.	William Stahler.
Titcomb, Joseph Alexander,	Columbia,	Tenn.	Titcomb & Towler.
Toplis, William George,	Germantown,	Pa.	William Conner.
Van Allen, Herman,	Ionia,	Mich.	Gundrum Bros.
Wallace, William Sampson,	Newark,	Ohio.	Hugh Campbell.
Wallis, Edward,	Philadelphia,	Pa.	Dr Wallis.
Warner, Frank Stephen,	Newark,	Ohio,	G. D. Blomer.
Warrington, Edward,	Moorestown,	N. J.	C. W. Warrington.
Webster, George C.,	Concordville,	Pa.	W. Procter, Jr., Co.
White, James Addison,	Mt. Vernon,	Ohio,	Baker Bros.
Whiteside, Wm. Elder,	Philadelphia,	Pa.	W. J. S. Whiteside.
Williams, George Eli,	Elmira,	N. Y.	Alonzo Robbins.
Winebrenner, George Byron,	Frederick,	Md.	Wm. Bell.
Yeakle, John,	Norristown,	Pa.	Atwood Yeakle.
Young, Preston Reuben,	Bethlehem,	Pa.	Dr. G. Schlosser.
Zaun, Henry,	Philadelphia,	Pa.	W. W. Moorehead.
Zeller, Chas. Frederick,	Philadelphia,	Pa.	J. P. Remington.
Zimmerman, Mason, Woodward,	Philadelphia,	Pa.	P. Niskey.

THE AMERICAN JOURNAL OF PHARMACY.

FEBRUARY, 1880.

The APOTHECARY'S APPRENTICE FIFTY YEARS AGO.

BY ROBERT SHOEMAKER.

Read at the Pharmaceutical Meeting January 20.

It was in the year 1831 the writer entered one of the best known apothecary "shops" (so-called then)—at that day—in this city, as an apprentice. Looking back to that time, and comparing the duties of the apprentice then with what they are now, one almost wishes he had been born 50 years later. The store was large for that day, situated on the corner of two of our principal streets, having three large "bulk" windows—with a show bottle for each pane of glass, making 24 bottles to each window.

The morning work began with taking down the shutters from these windows and two double doors, making the fire (if in cold weather), sweeping the store, cleaning and filling, with sperm oil (no gas in those days), a number of lamps, which were suspended from the ceiling. The shop was opened at 6 o'clock A. M. the year round, and this daily routine of work was to be finished before breakfast.

After breakfast (the work having been laid out the day before) began the preparation of medicines—as powdering (for, with a single exception, every powder was prepared by ourselves), the preparation of tinctures, pills, ointment, etc. *Gum* nipples were unknown then—heifer's teats trimmed out (and preserved in alcohol until wanted), tied over the mouth of an 8 ounce bottle, constituted the nursing bottle of the time. These were prepared in quantities for our own sale and for other apothecaries; how well I remember the bottle containing them standing right by the side of another containing clyster pipes—these to be attached to a bladder when required for use.

Thanks to Goodyear for the abolishment of these "implements."

I have said there was *one* drug we did not powder—not because it was difficult of reduction—but because my good preceptor saw fit to

patronize (with this one article) a worthy old character named John Price, who, in a frame shanty on Callowhill street, had, what he called, a drug mill. In this building old friend Price had erected some rude machinery, which was set in motion by a mule. The sole attendant, the proprietor, received such easily powdered drugs as were confided to his care through an 8 by 10 aperture from an outside vestibule. None were allowed a nearer approach than this to the wonderfully constructed powdering apparatus within. Of rhubarb we would have returned, *in due time*, about two-thirds in powder—the remaining one-third in a separate package labelled “crumbs.”

In that well remembered old iron mortar, so firmly seated on a stout post descending through the cellar to the earth, all else was powdered. Ipecac, gamboge, sanguinaria and cantharides (this last moistened with alcohol) arise to my mind (and *nostrils* too) as among the particularly obnoxious articles I was obliged to reduce to a *fine* powder. Those old boxed silk sieves were provokingly fine. I often thought a coarse material might have answered the purpose, but “Needles” had his orders.

My dear old preceptor, one of the best of men, was a firm believer in those lines of Watts :

“Satan finds some mischief still
For idle hands to do.”

Consequently the “embryos” were kept ever at work. Once in a fortnight all the bottles in the “shop,” together with the windows were to be washed. But, lest Satan might steal a chance to reveal that “mischief,” a large marble mortar, of 2 or 3 gallons capacity, was stationed in one corner, firmly fixed in the open top of a keg with a pestle of wood, having a long handle, passing through a support at the top, and in said mortar were always the ingredients for either mercurial ointment or blue mass—and that old seat by the side of that mortar was never empty, except when more important duties claimed our attention. What does the modern student in pharmacy know about the luxury of *killing* mercury?

Talk of a cat having 40 lives, why 40 *times* 40 will not suffice for the extinguishment of mercury; rub! rub!! rub!!! day after day and yet the labor continues. Thankful may the modern apprentice be that this work is now done by machinery.

But you will ask, “what time for study?” I will tell you. After

lamp light, between the calls of customers, we had the privilege of reading "Cox's Dispensatory," "Turner's Chemistry," "Ure's Chemical Dictionary," and, once in a quarter, the welcome "Journal of Pharmacy."

It is not to be wondered that, after the labors of the day, one found it difficult to keep awake throughout the long winter evenings. And I well remember how I sat, with book in one hand and a pound weight in the other, so that the dropping to the floor of the weight, in case of my being overcome with drowsiness, might arouse me.

We did a large prescription business (for that day) and in looking over the well-preserved books, containing the prescriptions from the year 1830 to 1855, my mind is sadly impressed with the fact that, so far as I know, not one of the well-known physicians in this city, in 1832, is now in practice, and, I believe, all but two or three have passed away. Those old formulas are interesting to behold. Sugar-coated pills, fluid extracts, highly colored, deliciously flavored elixirs, and a host of other medicaments were all in the womb of the future when these doses were prescribed. Infusions were much in vogue, larger pills and greater doses were swallowed in those days.

Allow me to present one or two prescriptions, taken at random, from "Book 1832:"

R	Pulv. rhei,	
	Pil. rufi,	āā 3ss
	Sapo.,	grs. viii
	Ol. carui,	gtt. iii
M. ft.	pil xii.	

What would our fastidious patrons of the present time, who object to an elegantly gelatin or sugar coated pill of *two* grains, say to these *six* grain fellows, as they lift them from their bed of Pulv. Glycyrrhizæ?

Take another:

R	Sulph. magnesia,	3iii
	Calomel,	Ḑi
	Tart. Antim,	gr. i
M. ft.	pulv. viii.	

And two days after, for the same patient:

R	Sennæ,	3vi
	Mannæ,	3iii
	Sem. fœnic.,	3ii
	Cream tartar,	3i

Sig.: Infuse in one-half pint of water two hours, and take a wine-glass full at a dose.

But enough, I give these specimens to show, by contrast with the present time, what great improvements have been made in the science of pharmacy. Generally, doses were large and nauseous. "Children," then, "did *not* cry for more."

A popular anthelmintic, fifty years ago, was: Rad. spigeliæ, \mathfrak{z} i; sem. chenopodii, \mathfrak{z} ii; sennæ, \mathfrak{z} ss; infuse, etc. Another was cowhage, given in molasses. Now we have santonine and other active principles, so combined with sugar and aromatics, in the form of confections, as to make the remedy a coveted "Bonne Bouche," and "children *do* cry for more."

In the summer of 1832 we had the first and most awful visitation of Asiatic cholera Philadelphia has ever experienced. Then it was that apothecaries had as much as they could well do, night and day. Many of my readers remember the camphor bags and Burgundy pitch plasters; the first worn in the bosom, suspended by a string around the neck, and the latter over the abdomen.

I have said we had no sugar-coated pills, or fluid extracts; neither had we machine-spread plasters. Apprentices then did have some advantages over those of the present time, their opportunities for learning the art of manufacturing were greater.

"The manufacturing pharmacist" was unknown. Apothecaries (wholesale dealers alone were called "druggists") made their own preparations, and all plasters were spread by hand, as wanted (adhesive plaster, on cloth, excepted).

The experience of 1832, therefore, made many perfect in the spreading of plasters. Ten by twelve and ten by fourteen inches were not unusual sizes. Well do I remember one nervous old gentleman, who, to ward off an attack of the dreaded disease, in addition to his camphor pouch, ordered a whole lamb-skin to be spread with Burgundy pitch, sprinkled with powdered camphor. The order was executed, the large plaster carried to his house by the writer and duly applied, covering well the stomach and abdomen. The next morning a messenger came to say that Mr. W. could not arise from his bed and dress, as the plaster had slipped down, and he required help. The removal of that plaster was a more difficult task than had been its preparation. It may be well to remark that the old gentleman escaped an attack of cholera, and lived many years to proclaim the virtues of camphor and Burgundy pitch as a preventive of Asiatic cholera.

My experience, at this time, in the preparation of plasters, was of great service to me in after years, as it led me to contrive a plan (succeeded, however, by the invention of another) which enabled me to produce plasters superior to any spread by hand. From 1838 to 1850 I manufactured large quantities, enjoying almost a monopoly of the business. In some weeks, I find, we spread as many as 5,000 plasters. But now, with improved machinery, the preparation of plasters, porous and others, has become an important industry. I have no means of learning the number produced annually, but from the great and constantly increasing demand it must be enormous.

NOTE ON SOME AMERICAN SPECIES OF ARTEMISIA.

BY JOHN M. MAISCH.

Nearly eight years ago ("Amer. Jour. Phar.," 1872, p. 196 and 295) I called the attention to *Artemisia Ludoviciana*, Nuttall, which was recommended as a hair tonic and as a febrifuge, for both purposes to be used in the state of infusion. From the interesting paper by Dr. E. Palmer (*Ibid.*, 1878, p. 590) we learn that the Pah-Utes use strong tea of the same plant to assist childbirth, and wads of the fresh plant to stop hemorrhage from the nose; even the fruit is employed by these Indians, ground fine, made into a mush and eaten. The species which belongs to the section *Abrotanum*, which has the flower-heads heterogamous, but all florets fertile, is found in Wisconsin and Illinois and westward to California and Arizona.

Recently I obtained a specimen of a plant sent from Arkansas, near the banks of the Mississippi, where it was stated to have made its appearance after a freshet in 1876, having been previously unknown in that section. Although accompanied with but few leaves, the plant was recognized as *Artemisia dracunculoides*, Pursh, and this was verified by comparing it with the specimens in the College herbarium. The plant is said to produce irritation when bruised, and a tea of it to be diaphoretic. Dr. Palmer reports the fruit to be used by the Pah-Utes as food in the same manner as the preceding species. The plant grows in western Illinois and westward, is common throughout Nevada, and extends southward to Arizona, west of the Sierras to California and northward to Oregon. It grows from 2 to 4 or 5 feet high, is some-

what woody at the base, glabrous or somewhat pubescent when young, has linear, entire leaves, the lower ones being occasionally threeleft, and an ample paniculate inflorescence, consisting of very numerous heads, which are about one-tenth inch in diameter. The herb has an agreeable, wormwood-like odor, which is not very strong; its taste is bitter, but by far less so than wormwood. The plant belongs to the section *Dracunculus*, which has the flowerheads heterogamous, but only the pistillate florets on the margin are fertile.

To the same section belongs *Artemisia filifolia*, Torrey, which is known in the west as *southern wood*. The plant grows to the height of 2 or 3 feet, has slender virgate branches and dense leafy panicles of very small, three- to five-flowered tomentose heads, in which only the two pistillate florets are fertile, while the rest are perfect but sterile. The leaves are filiform, revolute on the margin, the lower ones frequently threeleft; they are whitish tomentose, but when old become nearly smooth. According to Dr. Palmer the Pah-Utes use a decoction of it against swellings and bruises, and, by distillation, a very penetrating volatile oil may be obtained which is useful in liniments.

Of greater importance than the species named appear to be those which, in the States bordering on the Rocky Mountains, are called *sage-bushes* or *sage-brushes*. They belong to the section *Scriphidium*, are shrubby, have few-flowered heads and grow in arid localities. Two of the sage-bushes, *A. arbuscula*, Nuttall, and *A. trifida*, Nutt., are dwarfy, about 6 inches or the latter sometimes 18 inches high. But the more important, *A. tridentata*, Nutt., attains a height of 5 or 6 feet, has a ragged, fibrous bark, numerous spreading branches and crowded tomentose-canescant leaves, about an inch long, cuneate-oblong and with three short and obtuse teeth at the apex. It is a pale green shrub, and has a strong aromatic smell. Prof. Sereno Watson states that it covers hundreds of square miles in the plains and on the foothills of Nevada and Utah, and extends from Oregon to Arizona and Sonora, and as far east as the mountains of Colorado. According to Dr. Palmer, the Pah-Utes use a strong tea of this plant for headache, colds and for worms. By distillation a pungent volatile oil may be obtained from it.

The COLORING PRINCIPLE of FRASERA WALTERI, Mich.

BY J. U. LLOYD.

Read at the Pharmaceutical Meeting, January 20.

In 1840 Mr. J. W. Douglass examined the root of this plant (American Columbo), discovering a yellow crystalline substance. This he obtained in very small amount, and impure, from which reason he could not determine its nature with satisfaction, the conclusion being that the substance was a mixture of gallic acid and a yellow coloring principle ("Am. Jour. Ph.," vol. xii. p. 177). Mr. W. R. Higinbotham again investigated the constituents of this root (1857), obtained the yellow principle, but failed to purify it, ascribing to it "a bitter and nauseous taste," and stating that it was "partially soluble in chloroform" ("Am. J. Ph.," vol. xxxiv, p. 23). In 1868 Mr. F. W. Thomas submitted the root of this plant to a chemical examination, preparing the coloring principle and ascribing to it a bitter taste and acid reaction. "These crystals, when laid on moist litmus paper, reddened it decidedly" ("Am. J. Ph.," vol. xl, p. 310).

In 1873 Mr. G. W. Kennedy obtained, by a complex manipulation, yellow crystals. These possessed acid properties, and were supposed by Mr. Kennedy to be *gentisic acid* (gentianin or gentianic acid). ("Proc. Am. Pharm. Assoc.," 1873.) From a review of the published articles upon this subject it may be readily supposed that the coloring matter of the root is the acid obtained by Mr. Kennedy, and, arguing therefrom, we may well infer that the preceding examinations resulted in the discovery of this same substance in a more or less pure state where reference is made to the yellow coloring matter, more especially as two of the gentlemen ascribe to it acid properties. In connection with the subject, permit me to call attention to the specimens of crystals accompanying this paper, and the experiment instituted for the purpose of determining more carefully the nature of a substance previously obtained by the writer from the root of *Frasera Walteri*.

Carefully-selected root of *Frasera Walteri* was coarsely powdered and dried by exposure to a current of warm air (100°F.) in a drying room. Of this powder ten avoirdupois pounds were taken and submitted to percolation in a narrow cylindrical percolator, thus obtaining all practical contact between menstruum and powder. The menstruum employed was warm alcohol, s.g. .835, the operation being conducted in a warm room. The first five pints of percolate were reserved,

filtered, then submitted to a temperature ranging from 0°F. to -10°F. for the period of thirty-six hours, at the end of which the sides and bottom of the vessel were studded with a crystalline deposit consisting of two distinct classes of crystals, one class hard and transparent, the other needle-like and yellow.

The transparent were sweetish, contaminated with bitterness, soluble in water, slightly in alcohol, insoluble in ether. After trituration with repeated portions of alcohol (to remove grape sugar and adhering bitter principles) they were dissolved in water. The solution was purely sweet, refused to be affected by Fehling's solution and gave no reaction with tests for the alkaloids. Upon exposing the solution in a watch crystal to a current of air, 125°F. , crystals of the shape of cane sugar were deposited. These were charred by concentrated sulphuric acid. This substance was cane sugar. (See specimen.)

The second class of crystals were in beautiful lemon-yellow tufts radiating in silky needles from a common centre. They were bitter when first separated from the mother solution and acid to litmus paper, both of these characteristics depending upon the presence of adhering impurities. They were washed repeatedly in cold alcohol, in which they dissolved but slightly, then with warm water until free from sugar. As thus obtained (see specimen *A*), they were lemon-yellow, odorless, tasteless. They were insoluble in cold water, but tinged boiling water slightly straw color. They dissolved slightly in cold alcohol, freely in boiling alcohol, very freely in cold ether, cold chloroform and cold carbon disulphide, more being dissolved by each menstruum which followed that preceding. The crystals were neutral to moistened litmus paper, red or blue, and all of the solutions failed to affect either colored paper. When the crystals were boiled with water, the addition of ferrous sulphate and ferrous chloride failed in both cases to produce a precipitate or alter the color of either crystal or solution towards blue or green.

With nitric acid the crystals dissolve, forming a deep-red solution without evolution of nitric oxide. With sulphuric acid they form a deep orange-red solution. With hydrochloric acid in the cold, no apparent change; upon boiling, the acid becomes straw-colored, while the crystals seemingly remain unaltered. They refused to unite with either of the aforementioned acids when dilute.

Upon boiling the purified crystals some time with dilute sul-

phuric acid, a yellow oily substance rose upon the surface and the crystals disappeared. Upon cooling, this substance solidified to a waxy consistence and sunk to the bottom of the tube. The supernatant colorless liquid was filtered, neutralized with carbonate of calcium, filtered again and the filtrate tested with Fehling's solution; no precipitate.

The crystals change cold ammonia water to yellow, but do not neutralize it. With cold concentrated solution of caustic potash or caustic soda no change is apparent; upon boiling, the crystals turn orange-red. Dilute solution of caustic potash turns yellow, but is not neutralized. Upon heating them with caustic potash, no evolution of ammonia resulted.

All attempts to obtain the reaction of an alkaloid or an acid with the ordinary reagents from any solution of the crystals resulted in failure. These crystals are those of an indifferent organic body differing from any heretofore examined by the writer. The process employed in obtaining it is so simple as to forbid the idea that the crystals are a product of manipulation and the result of a splitting up of some natural compound, which might result when excessive or long-continued heat is resorted to, or the use of chemicals. It may be safely accepted that this substance is *a*, perhaps *the*, principal coloring matter of the root.

Reasoning from the foregoing, and comparing the process employed by myself with those of preceding investigators, I think it may safely be supposed that the same substance, in a more or less impure state, was previously obtained. To the first investigator, Mr. Douglass, may well be ascribed the credit of the discovery, since he concluded the substance obtained by himself to be a *yellow coloring principle* mixed with gallic acid. Again, others state that as obtained by themselves it was partially soluble in chloroform, and we may well infer the *insoluble* matter to have been impurities.

Adhering to the crude crystalline masses of mixed crystals I found, as might be supposed, a small amount of grape sugar. Accompanying this paper I send an ample quantity of the mixed crystalline matters obtained by myself. They have been washed with cold alcohol to separate the adhering bitter substance. Also a supply of the purified yellow crystalline substance (*A*).

THE OXIDATION OF FERROUS SALTS AT LOW TEMPERATURES.

BY F. L. SLOCUM.

Read at the Pharmaceutical Meeting January 20:

There appeared in this journal for March, 1879, page 141, a new process for the preparation of solution of perchloride of iron, without the aid of heat, by adding the acid solution of ferrous chloride to the requisite quantity of nitric acid.

In the Journal for December, 1879, page 587, is a verification of the successful application of this process, and a like happy result is reported with Monsel's solution, by the same procedure.

At the request of Prof. Maisch, and under his directions, I made numerous experiments with the following results:

Liquor Ferri Perchloridi.—The acid solution of the ferrous chloride and the nitric acid had a temperature of 78°F. , the temperature of the room; on slowly adding the acid ferrous chloride to the nitric acid the temperature rose to 120°F. Oxidation was quite energetic, and nitrous fumes were given off constantly without foaming. When about two-thirds of the ferrous chloride was oxidized the temperature had receded to 105°F. , and oxidation was hardly perceptible, and when the whole of the ferrous chloride had been added, which required about fifteen minutes' time, the temperature of the solution had receded to 85°F. After standing a while the solution acquired a color similar to the officinal liquor, but owing to the great range of temperature it passed through in oxidizing, several nitrogen oxides were formed and remained, contaminating the solution; complete oxidation was not effected, and it is next to impossible to free the solution from nitrogen compounds.

After making numerous experiments, each time using a little higher temperature to begin with and a slight modification of the process, the following was found to be a very practicable process, and the lowest temperature that could be used to get at correct results:

Mix the nitric and reserved hydrochloric acid in an evaporating or suitable basin, heat them to a temperature of 140°F. , and filter into the mixed acids the solution of ferrous chloride previously heated to 180°F. ; stir the solution while the liquids are mixing; oxidation takes place gradually and completely, the temperature rising to 160°F. or 165°F. There is no accumulation and sudden expulsion of nitrous fumes causing foaming, as in the officinal process. The result is an

acid solution of ferric chloride answering to the requirements of the Pharmacopœia.

Liquor Ferri Subsulphatis.—A saturated aqueous solution of the ferrous sulphate was made, and to it the sulphuric acid was added; this solution was gradually added to the requisite quantity of nitric acid, both the acid solution of ferrous sulphate and the nitric acid being at 76°F. ; on mixing, the solution acquired a temperature of 116°F. , and only partial oxidation ensued, leaving a dense black liquid which, on standing two days, acquired a color similar to the officinal liquor, but contained both ferrous and ferric sulphate with nitric acid.

Several experiments were made, using each time an increase in temperature, until the following process was found to give a satisfactory result:

Mix the nitric and sulphuric acids (using a slight excess of nitric acid), heat them to 140°F. ; make a hot saturated aqueous solution of ferrous sulphate (if necessary a few drops of sulphuric acid may be added), and when at a temperature of 180°F. or 190°F. filter it into the heated acids; oxidation takes place quietly and completely, the nitrous fumes being given off gradually from first to the close of the operation. After oxidation is completed the solution should be kept at 140°F. for a few minutes, to remove all traces of nitrous fumes. The result is a solution of ferric sulphate, with a slight trace of nitric acid.

The particular advantage of these formulas is that there is no accumulation of nitrous fumes, followed by their sudden expulsion at the end of the oxidation, causing foaming and making the use of capacious dishes a necessity. But the oxidation and liberation of the nitrous fumes takes place at the same time, from the first gradually to the close of the operation, of course the low temperature required is also a marked advantage.

SYRUP OF BROMIDE OF ZINC.

BY L. LYONS.

Read at the Pharmaceutical Meeting January 20.

The processes for the preparation of the bromide of zinc given in the chemical text-books are based upon either the direct combination of zinc with bromine, or the metal is dissolved in an aqueous solution of hydrobromic acid.

The disadvantages of manipulating with free bromine are obvious. In the second process the hydrobromic acid solution is not easily obtained by all pharmacists, nor are they all supplied with the conveniences for making the acid.

For these reasons experiments were performed in the College Laboratory with the view of obtaining a formula whereby pharmacists could make, from materials always on hand, a solution of bromide of zinc for the purpose of making the syrup of bromide of zinc.

The following process depends upon the double decomposition of bromide of potassium and sulphate of zinc.

The quantities used were taken according to the proportion existing between the molecular weights of the salts, which is about 5 to 6, or 2 molecules of bromide of potassium (238) to 1 of crystallized sulphate of zinc (287). $2\text{KBr} + \text{ZnSO}_4 = \text{ZnBr}_2 + \text{K}_2\text{SO}_4$.

Experiment I. 35 grains of potassium bromide and 42 grains of crystallized sulphate of zinc were triturated in a mortar, and after the mixture had become liquid alcohol was added to dissolve the resulting ZnBr_2 . The solution was then filtered from the crystalline precipitate; the zinc was precipitated by sulphhydrate of ammonium, filtered, the filtrate evaporated to dryness, and a residue was obtained which was found to be bromide of potassium. The precipitate obtained by alcohol was washed with alcohol, and then contained the sulphates of both metals, but was free from bromide.

Experiment II. 100 grains of potassium bromide and 120 grains of crystallized sulphate of zinc were dissolved separately in a small quantity of water, and the solutions mixed while hot. When the liquor was cold, twice the bulk of alcohol was added, the precipitate removed by filtration, and the filtrate treated the same as in experiment I. In this also, was found a large percentage of bromide of potassium.

These experiments were repeated, and with the same results.

It necessarily followed that either the process or the manipulation was faulty.

Iodide of zinc in the presence of any of the iodides of the alkaline metals forms a double salt.

As iodine and bromine act similarly in combining, the conclusion is that in the above experiments the double salt, KBrZnBr_2 , was formed. In order to decompose this double salt, a larger quantity of zinc sulphate must be used. The quantity was doubled, as follows:

Experiment III. 100 grains of potassium bromide and 240 grains of crystallized sulphate of zinc. The same process as II was followed. The residue, after treatment with sulphhydate of ammonium, was very minute—a trace of potassium salt.

A solution of bromide of zinc, made by acting with bromine upon the metal, was filtered through paper and evaporated to dryness. It gave a dark grey colored mass, whereas a portion of the same solution, filtered through asbestos and evaporated, gave a perfectly white mass. The coloration in the former case is evidently due to organic matter, showing the analogy of the bromide with chloride of zinc, which also dissolves organic matter, showing the analogy of the bromide with chloride of zinc, which also dissolves organic matter. Even the alcoholic solution of bromide of zinc, filtered through asbestos, will yield a dark colored salt on evaporation.

Perhaps the most convenient preparation for the administration of bromide of zinc would be a syrup of definite strength. A syrup containing 10 per cent. of dry bromide of zinc was made by using the solution from experiment III, and evaporating the alcohol. The amount of dry bromide was calculated, and found to be 92 grains. Water was added to make the whole weigh 414 grains, and afterwards 506 grains of sugar, which was dissolved without the aid of heat. The proportions used are as follows:

92 grains ZnBr ₂,	.	.	.	.	.	10 parts
322 grains water,	.	.	.	.	.	35
506 grains sugar,	.	.	.	.	.	55
<hr/>						
920 grains.						100 parts.

Formula for making 1,000 parts of Syrupus Zinci Bromidi.

Take of	Bromide of potassium,	.	.	.	106 parts
	Crystallized sulphate of zinc,	.	.	.	255

Dissolve the salts separately in the least quantity of water, and mix while hot. Allow the mixture to stand until cold, then add twice the bulk of alcohol; stir it well and filter. Evaporate the filtrate until the alcohol is gone, then add enough distilled water to make the solution weigh 450 parts; transfer to a bottle and add sugar, 550 parts. Dissolve without heat.

The syrup is transparent and nearly colorless. It is inodorous and has an astringent and somewhat metallic taste. It can be given in combination with most tinctures and syrups. An agreeable preparation is made by combining it with orange-flower water.

TINCTURE OF KINO.

BY G. W. KENNEDY, PH.G.

In submitting the results of numerous experiments I am highly gratified to state that a tincture can be made which will not gelatinize, and hope that those pharmacists, who have occasionally been annoyed by the change alluded to, will try the modified process, and have no cause in the future to complain.

There is scarcely a pharmacist, in whose locality the tincture is used, that has not been annoyed with several of the astringent tinctures, and more particularly with the tincture of kino. The process of the present Pharmacopœia is a decided improvement over that of 1860; but gelatinization occurs sometimes shortly after preparing the tincture, and its instability is the reason why some physicians have abandoned its use.

Several remedies have been proposed from time to time to prevent gelatinization and consequent loss of astringency. Against one of these, glycerin, I have very little to say, since a tincture, when made with a menstruum consisting of 2 parts water, 1 part alcohol and 1 part glycerin, kept apparently unchanged until the beginning of the ninth month, when all at once, as it were, it became a semi-solid mass.

Alkalies have been recommended, but they change the tannin and destroy the astringency, and a similar effect has carbonate of magnesium. Half a pint of tincture was carefully prepared according to the method recommended in "*American Journal of Pharmacy*," 1873, page 260, and had but a slight astringent taste, and was scarcely darkened in color on the addition of salts of iron.

It is true that a stronger alcoholic menstruum, as recommended by some writers, exhausts kino more rapidly and satisfactorily than perhaps any other solvent, and the tincture, as thus prepared, so long as the alcoholic strength is preserved, I believe will not gelatinize, but if the preparation is insecurely kept evaporation of the alcohol takes place and the tincture gelatinizes. It must also be remembered that medicinally it is not always desirable to administer a preparation containing so much alcohol.

The formula which I recommend is not altogether original with me, similar ones being in use in Philadelphia and perhaps elsewhere. In my hands it has given perfect satisfaction in preserving the tincture.

Five pints each of each tincture of kino and of catechu were made in June, 1878; at this date there is no precipitation or gelatinization of what is left, about a pint in each bottle, and the preparations are just as reliable to-day as they were then.

Therapeutically, there can be no objection to the use of a small quantity of logwood entering the preparation, as it has likewise astringent properties.

The formula is as follows: Take of kino three troyounces, logwood half a troyounce, diluted alcohol a sufficient quantity. Reduce the kino and logwood to coarse powder, and prepare in the usual way by percolation.

Pottsville, Pa., January, 1880.

ADDITIONAL REMARKS BY THE EDITOR.—At the last meeting of the British Pharmaceutical Conference, Mr. B. H. Bamford read a paper on the same subject, recording his observation with a tincture which had been purchased from a London drug house between 1862 and 1864, and since that time had been kept in a partly filled bottle covered with blue paper, and dusted and shaken every morning; although over fifteen years old the tincture did not gelatinize, and the remedy proposed against the trouble was daily agitation and a cover of blue paper.

From the subsequent discussion we make a few brief abstracts. Mr. Martindale was of opinion that much depended on the age, and in the opinion of Mr. Umney on the source of the kino used. Mr. T. F. Abraham had never seen the tincture gelatinize during fifteen years; Mr. Preston had used the tincture for seventeen, and Mr. Hasselby for twenty-five years, and both noticed only one case of gelatinization. Only one instance was also observed by Mr. Robbins and by Dr. Symes. Messrs. Ellinor and Savage had known the tincture prepared by one establishment to gelatinize, and made by others to remain liquid; the latter had been exposed to the light. The use of glycerin for its preservation was also alluded to, but it remained to be proved whether the addition affected prejudicially the astringency of the tincture.

These are the observations. As to the remedy, it was the opinion of the President, Mr. Schacht, that it lay not so much in the management of the preparation as in the selection of the material of which it was

composed; and Mr. Ellinor stated that kino which tinged the saliva was the best kind, and it never gelatinized as far as his experience went. None of the speakers expressed any faith in the remedy proposed by Mr. Bamford.

Although kino has been repeatedly the subject of chemical investigation, the conditions under which the tincture is occasionally transformed into a jelly have not been determined; but we believe it is generally admitted that a watery menstruum favors and alcohol prevents or retards the change. Most of the European Pharmacopœias use alcohol of about .835 specific gravity; the French Codex directs 60 per cent. alcohol. It seems to us that the only admissible remedy is the alcoholic strength of the menstruum, until, by comparative experiments with kino of well determined origin or properties, the effectiveness of other proposed remedies has been demonstrated.

TINCTURE OF CHLORIDE OF IRON.

BY G. H. CHAS. KLIE.

The Pharmacopœia has the tincture prepared from one part of solution of chloride of iron and three parts of alcohol. The solution of chloride of iron is prepared by dissolving iron wire in hydrochloric acid and oxidizing the iron by the addition of sufficient nitric acid. The Pharmacopœia directs putting the acid and iron wire together into a flask and letting the mixture stand until effervescence ceases, then heating to the boiling point, decanting, filtering, etc. Warmth or heat will in most instances dissolve and, under proper conditions, keep in solution more of a given salt than what will be dissolved at ordinary temperature. So in this instance, although the mixture, when reaction has thoroughly set in, gets warm, the more concentrated the solution becomes the more the reaction will diminish, and, as a consequence, warmth will decrease, until finally the whole cools off and effervescence ceases. If the mixture is now heated to the boiling point, effervescence re-begins, and if allowed to go on, it may take an hour or two before it ceases, showing that by heating considerably more iron has passed into solution. According to the wording of the Pharmacopœia, it appears as if the heating to the boiling point, decantation, filtration, etc., were to follow close upon one another. If it read, "Place the mixture on a vapor or water bath until effervescence ceases, decant, filter," etc., a solution of chloride of lime having full strength would result.

However, if one has prepared the solution repeatedly, and has taken the trouble to test the same each time, the defect of the formula and how it is overcome will soon become apparent.

The writer of this, being curious as to the quality of tincture of iron sold here, procured twenty-five samples from the same number of apothecaries located in all parts of the city. These samples were tested, as the Pharmacopœia directs, under solution of chloride of iron, viz.: When diluted with water, it affords no precipitate with chloride of barium or ferridcyanide of potassium. When a crystal of sulphate of iron is added to a little of the solution, and afterwards a few drops of sulphuric acid, a black color is not produced near the crystal. Two fluidrachms of the solution (or one fluidounce of the tincture) treated with ammonia in excess yield a precipitate of sesquioxide of iron, or ferric oxide, which, when washed, dried and ignited, weighs 28.25 grains. The external characteristics of the tincture were noted also. The result is given in the following table:

Sample.	Quantity of ig- nited Sesqui- oxide of Iron in 1 fl. oz. of tincture.	Color.	Ethereal odor.	Chloride of Barium Test.	Ferridcyanide of Potassium.	Crystal of Sul- phate of Iron with Sul- phuric Acid.
1	22.8	light yellow-brown	slight	faint precip.	no precip.	no black color
2	28.25	light red-brown	none	" "	" "	" "
3	24.8	light yellow	slight	" "	blue "	" "
4	18.4	light red-brown	"	" "	no "	" "
5	20.	red brown	modrt.	copio's "	blue "	" "
6	26.8	light yellow	none	" "	" "	" "
7	12.8	"	"	no "	" "	" "
8	24.	"	slight	" "	" "	" "
9	24.	"	none	" "	" "	" "
10	4.8	brown-red	strong	faint precip.	no precip.	black color
11	20.	"	none	" "	" "	" "
12	22.8	light yellow	slight	faint precip.	blue precip.	no black color
13	26.	"	trace	" "	" "	" "
14	28.	"	marked	" "	" "	" "
15	28.25	black-green	none	faint precip.	blue precip.	no black color
16	28.	light yellow	slight	" "	" "	" "
17	30.	brown-yellow	"	" "	" "	" "
18	28.25	light yellow	marked	" "	" "	" "
19	24.	brown-yellow	modrt.	" "	" "	" "
20	21.	dark brown	none	precipitate	blue precip.	no black color
21	28.25	black-brown	"	faint precip.	no "	" "
22	18.	light yellow	faint	v'ry ltl. "	" "	black color
23	16.8	"	trace	no "	" "	no black color
24	20.4	brown-yellow	marked	faint "	blue "	" "
25	27.6	"	faint	small "	no "	" "

Four tinctures, or 16 per cent. of the samples, have the right strength; one is too strong; four tinctures, or 16 per cent., almost reach the standard, and the balance, or 64 per cent., average from 4.8 to 25 grains; average strength, 14.73 grains, or 67.88 per cent.

What is the reason that, taken strictly, only 16 per cent. of the apothecaries dispense a full-strength preparation? One may infer that either, if the solution was prepared by the apothecary himself, the defect in the formula was not detected and avoided, or, if purchased, the preparation was made by some one who was in the same predicament, or who paid no attention whatever to the *Pharmacopœia*. However, since the apothecary stands between the manufacturer and the prescribing physician, he ought to demand a preparation from the former which, if tested by the latter or himself, would meet the requirements of the *Pharmacopœia*. If this course were strictly followed, the dispensing of an officinal tincture would soon become the rule, and not the surprising exception, as at present. Another exceedingly humiliating inference might be drawn from the perusal of the above table, namely, that the average apothecary will freely dispense a preparation which he may either lack the ability to prepare as it ought to be prepared, or he may be too indolent to do it, consequently will, without compunction or considering the responsibility resting upon himself, dispense a preparation prepared by others which he is too lazy even to test. He takes for granted that because he purchases from an apparently honest and reliable wholesale house, and because the general external characteristics of the tincture are present, therefore the preparation must necessarily be full strength. It isn't safe; in fact, the strength of tincture of iron cannot be judged by the general external characteristics.

The tincture of chloride of iron is a preparation which figures frequently in physicians' prescriptions, and great reliance is placed upon it in some very grave affections of the human system. Furthermore, it is almost as frequently sold over the counter as paregoric or essence of peppermint. The very least, therefore, that the apothecary can do is to dispense a tincture which will contain the amount of iron intended by the *Pharmacopœia*.

In earlier editions of the *Pharmacopœia* the tincture was prepared by dissolving, with the aid of a gentle heat, one-half pound of the so-called subcarbonate of iron in a pint of hydrochloric acid and adding three pints of alcohol. This formula did not give universal satisfaction, on

account of the variability of the product. Undoubtedly this variability was not the result of the insolubility of the subcarbonate alone, but may, more or less, have been the result of defective manipulation—as, for instance, the non- or improper application of heat to effect solution. The writer of this well remembers a very expeditious and easy method followed by several apothecaries of this city; but the resulting tincture does not reach the standard of the Pharmacopœia by 50 per cent. It is: Place the subcarbonate of iron in a bottle of sufficient size, pour on the hydrochloric acid, shake frequently until effervescence ceases, add the alcohol and filter. This finishes the tincture. An ounce of the tincture made in this manner treated with ammonia in excess, and the precipitate washed, dried and ignited, was found to weigh 12·8 grs.

Lowell, N. St. Louis, January, 1880.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER.

Inorganic Chemistry.—*Volatility of Platinum.*—Victor Meyer notices the recent statements of F. Seelheim as to the volatility of platinum (this Journal, current volume, p. 18), and shows that they have no applicability to his results on the vapor-density of chlorine at high temperatures. In these experiments the decomposition of the platinous chloride left the platinum in the form of a small stick of coherent platinum sponge of exactly the shape of the little glass bulb used for the platinous chloride. Moreover, the weight of the platinum left was almost absolutely the weight required by calculation of the composition of the platinous chloride. Again, the results gotten where iodine was used were just as anomalous as those gotten with chlorine, and of course the iodine was used from the beginning as pure iodine. So the Victor Meyer results remain as yet unexplained, the author giving no further information and expressing no views as to the reason of the variance from normal density.—*Ber. der Chem. Ges.*, xii, p. 2202.

Crystallization of Carbon.—At a meeting of the Glasgow Philosophical Society, on Wednesday, Dec. 24th, 1879, Mr. James Mactear stated that he had obtained transparent crystals of the form and refractive power of diamonds. They resisted acids, alkalies and the intense heat of the blow-pipe, and scratched glass. Prof. Maskelyne (Dec. 31) found these crystals not to scratch either topaz or sapphire, not to

burn in a stream of oxygen, but to dissolve in hydro-fluoric acid, showing them to be a silica compound, the correctness of which conclusion was subsequently acknowledged by Mr. Mactear.—*Chem. News*.

Production of Ozone, Test for Manganese and Cause of Hydrogen Explosions.—At the meeting of the German Scientific Association for 1879, held at Baden-Baden, Sept. 19th to 23d, Prof. Böttger made some observations upon the above subjects. He had observed that if, instead of covering small sticks of phosphorus half their length with water, solutions of potassium bichromate were used, ozone was much more readily obtained. Also that the red coloration of chemically-pure fused potassium chlorate caused by traces of manganese compounds was an extremely delicate test for manganese. The frequent explosions which take place in the preparation of hydrogen by the action of sodium upon water he thought might be explained by the assumption of the formation of a sodium peroxide, which, in liberating oxygen, formed an explosive mixture with the hydrogen.—*Ber. Chem. Ges.*, xii, p. 2187.

On a Hydride of Silicon.—J. Ogier has submitted pure silicon hydride to the action of the electric discharge. After a time pure hydrogen only remains, while a yellow coating is formed in the interior of the tubes. This on analysis proves to be a body of the composition Si_2H_3 , a subhydride of silicon, corresponding to C_2H_3 , crotonylene. When moderately heated in air it burns, throwing off small sparks. It is inflammable in chlorine when cold; when heated cautiously in an atmosphere of hydrogen or nitrogen, it evolves siliciuretted hydrogen. He has also studied the action of the electric discharge upon arseniuretted hydrogen; it also forms a solid hydride, As_2H , corresponding to the solid phosphide of hydrogen, P_2H .—*Comptes Rendus*, Dec. 22, 1879.

Organic Chemistry. — On Solid Hydrocyanic Acid.—Messrs. Lesœur and Rigaut have made some studies upon the solid products which separated from hydrocyanic acid solution. They remark that pure hydrocyanic acid can be preserved very long, and it is usually the presence of ammonium cyanide and water, which changes it into the solid black substance called azulmin. A trace of potassium cyanide brings about this decomposition even in the absence of water. The black mass is ordinarily amorphous, but often permeated with more or less transparent crystals, which can be extracted with boiling benzol. In this way are obtained colorless, lustrous crystals, which easily become

brown and decompose, are dissolved by alcohol or boiling water readily, although very slightly in cold water. Their composition is CNH . The body dissolves readily in acids; with hydrochloric acid it yields a black hygroscopic mass, which probably possesses the composition $(\text{CNH})_3 \cdot 3\text{HCl} \cdot 3\text{H}_2\text{O}$. The solid hydrocyanic acid changes under the influence of the air and moisture into new products containing azulmin. If this latter be treated with warm alcohol, a dirty-red amorphous powder is extracted, which is only slightly soluble in water, but dissolves in alcohol with a red color, and has the formula $(\text{CNH})_3 \cdot \text{H}_2\text{O}$.—*Ibid.*, Aug. 4, 1879.

Presence of Cumol in Pennsylvania Petroleum.—Engler made the interesting statement to the German Scientific Association, at Baden-Baden, that about 0.2 per cent. of cumol is contained in this petroleum, and that this small amount would nevertheless make about 1,400,000 kilograms of cumol yearly imported into Germany. Petroleum naphtha contained at least this amount, also, of cumol. The determination of this hydrocarbon was made as tribromcumol, of which specimens in needles, one to two inches in length, were shown.—*Ber. der Chem. Ges.*, xii, p. 2187.

On Glycyrrhizin.—Habermann has published the results of a detailed investigation of this subject. By repeated recrystallization of the commercial glycyrrhizinum ammoniacale out of glacial acetic acid and strong alcohol, he obtained the acid ammonium salt of glycyrrhizic acid, $\text{C}_{41}\text{H}_{62}\text{NO}_{18} \cdot \text{NH}_4$, in slightly colored crystalline plates. This salt is very easily soluble in boiling water, insoluble in ether, slightly soluble only in absolute alcohol or alcohol of more than 90 per cent. in strength. It is left, on evaporation of its aqueous or weak alcoholic solution, as an amorphous brittle mass. Small amounts of alkalis increase its solubility in water in an extraordinary degree. The salts of the heavy metals produce voluminous precipitates in its aqueous solutions. Ordinary nitric acid dissolves it, yielding a colorless solution, but when heated a copious evolution of gas ensues and resinous flocks separate out. Concentrated sulphuric acid dissolves it with orange-red color, from which solution water precipitates colorless flocks. It possesses an intensely sweet taste with the characteristic after-taste, which, however, disappears more and more as it is purified. The glycyrrhizic acid itself is a tribasic acid. The neutral ammonium glycyrrhizate is a clear-brown amorphous mass of unpleasantly sweet taste, easily solu-

ble in water and weak alcohol, insoluble in absolute alcohol. The neutral potassium salt is a yellowish-white, loose, amorphous mass; the acid potassium salt, $C_{14}H_{62}NO_{18}K$, forms small crystalline grains of an intensely sweet taste, and behaves with reagents like the acid ammonium salt. The lead salt is an amorphous precipitate. The free acid prepared from the lead salt is amorphous, decomposes already at 100° and reduces Fehling's solution rapidly.—*Ann. Ch. und Phar.*, 197, p. 105.

Contributions to the Knowledge of Quinamin.—Oudemans has studied this alkaloid discovered by Hesse in the *Cinchona succirubra*. Hesse had given the composition at first as $C_{20}H_{26}N_2O_2$, but later changed this to $C_{19}H_{24}N_2O_2$. Oudemans' analysis of the free base appeared to substantiate the first formula, but the iodine determinations in the well-crystallized iodhydrate corresponded better with the second formula, so the matter is left uncertain. The following reactions appear to be characteristic of quinamin:

If a drop of the solution of a quinamin salt be carefully added to concentrated sulphuric acid, which contains a small amount of nitric acid, there is produced a chestnut-brown color at the point of contact. If the solution be concentrated, orange colored in case the solution be more dilute, and, on continued dilution with water, at first a purple color and then a faint rose-red color.

If one writes upon paper with a not too concentrated solution of quinamin, in a slight excess of sulphuric acid, and lays the paper with the written side down upon a watch crystal, in which have been placed a little sulphuric acid and a few crystals of potassium chlorate, the writing becomes brownish or olive colored. On taking the paper away the written characters gradually become rose colored.—*Ber. der Chem. Ges.*, xii, p. 2101.

On Pilocarpina.—Alex. Poehl delivered an address upon this alkaloid at the Baden-Baden Meeting of the German Scientific Association. The pilocarpine remains unaltered, even after two days' heating with hydrochloric acid or with baryta water. On the contrary, the distillate gotten by heating the alkaloid with caustic soda solution contains a body probably identical with conia. The paper contains, besides, notices on the detection of pilocarpine when mixed with other poisons, on the color reaction with potassium bichromate and sulphuric acid and the spectrum thus obtained, and finally on the method of its quan-

titative determination with phosphomolybdic acid in the presence of free hydrochloric acid.—*Ibid.*, p. 2185.

Technical Chemistry.—*On the Preparation of Potassium Carbonate by the Action of Trimethylamin.*—In order to apply to the potash manufacture a reaction analogous to that involved in the well-known ammonia-soda process of making sodium carbonate, the Croix Stock Company, of Croix, France, have patented the use of trimethylamin. A mixture of 1 part potassium chloride and 4 parts of the trimethylamin of commerce is saturated with carbonic acid gas. There is formed at first carbonate and bicarbonate of trimethylamin, which reacting with the potassium chloride forms easily soluble trimethylamin hydrochlorate and potassium bicarbonate, which remains insoluble under these conditions. The reaction takes place at ordinary temperatures, although cold, pressure and stirring facilitate it. In 3 to 4 hours, pure potassium chloride can readily be converted into a product containing 97 to 99.5 per cent. of potassium carbonate, the bicarbonate first formed having been converted into neutral salt, according to the ordinary methods.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

Blaud's Ferruginous Pills.—A good pill mass, of a green color and remaining soft, so as to be readily formed into pills, and allowing other substances, usually given in connection with iron, like quinia, morphia, etc., to be mixed with it, is prepared by I. Pitschke from carbonate of potassium and sulphate of iron, each 2 parts, made into a pillular mass with one part of an excipient consisting of carbonate of magnesium, glycerin and grape sugar; $2\frac{1}{2}$ parts of this mass contain 1 part iron sulphate.—*Pharm. Ztg.*, Dec. 3, 1879, p. 750.

A New Test for Free Mineral Acids in Vinegar. particularly well adapted for testing so-called brandy vinegar, is suggested by Hager, and consists in adding to 20 cc. (= 20 grams) vinegar, contained in a previously-weighed shallow glass evaporating dish, 4 cc. liquor ammoniæ, and exposing the mixture to a temperature above 70°C. On evaporation, pure vinegar will leave only a light or dark-brown spot, while if tartaric or a mineral acid is present, a crystalline residue remains, and, if largely adulterated, a sufficient quantity will remain for the quan-

titative determination of the acid.—*Pharm. Centralb.*, Dec. 4, 1879, p. 450.

Alkargene, or Cacodylic Acid.— $\text{AsH}(\text{C}_2\text{H}_3)_2\text{O}_4$ was declared to be an entirely innocent compound by its discoverer, Bunsen, and by others, although it contains so much arsenic. Lebahn contradicted their statement, and is now corroborated by H. Schulz, whose recent investigations proved that the acid, both when taken internally and when injected, is very poisonous. — *Ztschr. d. Allg. Oest. Apoth. Ver.*, Dec. 10, 1879, p. 528, fr. *Ber. d. Deutsch. Chem. Ges.*

Borocitrate of Magnesium is a white powder having an acid taste but no odor, and is considered by Dr. Kœhler a very valuable therapeutic agent in the treatment of stone and gravel in the bladder and kidneys and for bladder catarrh. It is usually given in the form of a mixture of magnesium borocitrate 40 grams, powdered sugar 80 grams and oil of lemon 1 drop, a dessert-spoonful of which is administered three times daily in half a tumblerful of water.—*Pharm. Post*, Dec. 16, 1879, p. 374, fr. *Berl. Klin. Wochenschr.*

Solvents of Gun Cotton.—Bardy enumerates the usual mixture of alcohol and ether, acetone, methylic alcohol and glacial acetic acid. The solving power of the mixture of alcohol and ether is too well known to require further mention.

Acetone is soluble in water in every proportion, and is one of the best solvents of the cotton. If the solution is poured into water, the acetone immediately combines with the latter, while the cotton is precipitated in distinct large white flakes, which can be readily washed and dried, when 3 grams occupy the space of almost 200 centimeters

Methylic alcohol likewise mixes with water in every proportion and dissolves the cotton readily, yielding a somewhat cloudy solution, which, if poured quickly into water, precipitates the cotton as a compact gelatinous mass; if poured in a very thin stream into cold water, a very voluminous mass results, 25 grams of which occupy the space of 2 liters; when dried, this mass resembles horn in appearance, is semi-transparent and amber-colored, and dissolves readily in the mixture of alcohol and ether. ★

Glacial acetic acid readily dissolves gun cotton, the solution possessing the same behavior as that in acetone towards water; on drying, every trace of acetic acid is volatilized. — *Pharm. Ztschr. f. Russl.*, Nov. 1, 1879, p. 659, fr. *Polyt. Notizbl.*

A Tincture of the Root of Baptisia Tinctoria (see "Am. Jour. Phar.," 1862, p. 310, and Dec., 1879, p. 577), was used with very good success by Johnson in the treatment of seven cases of typhoid fever, three of which were very severe, in the dose of 1 to 5 drops every one to four hours in connection with cool lotions, milk and stimulants; it almost entirely prevented delirium and diarrhœa, diminishing the heat and soon affecting a cure. The root has a sickening taste, causes vomiting and diarrhœa when taken fresh, and was formerly used, as Dr. Rosenthal informs us, as an antiseptic remedy in scarlet and typhoid fever, and also as a substitute for quinia.—*Pharm. Centralb.*, Nov. 20, 1879, p. 438.

The Seeds of Simaba Cedron, Cedron tree, N. O. Simarubææ, indigenous to New Granada, resemble almonds in appearance and are known as "Cedron." They are prescribed by the physicians of New Granada as a fever medicine, and are also used internally and externally as an antidote for the bite of poisonous animals. The natives of New Granada and Central America never venture into the forests unless supplied with a few of the seeds, which are cut into thin transverse sections, and these are applied to the wounds. Fever patients cut the seeds into pieces the size of a pea, which they swallow gradually. Hager attributes their efficiency to quassiin, the bitter principle of quassia, a large percentage of which he supposes is contained in them. The seeds of other species, like *S. ferruginea*, St. Hil. (*Picrodendron calunga*, Martius), are probably collected in Brazil as "Cedron."—*Ibid.*, Nov. 20, 1879, p. 435.

Eugenia cheken, N. O. Myrtaceæ, indigenous to the forests of Chili, is recommended by Augusto Borchers, at Valparaiso, as a new valuable drug. The inhalations of the vapors rising from its aqueous infusion are stated to be very efficacious in the treatment of diphtheritis, bronchitis and laryngitis, while the aqueous infusion and the extract of the plant were successfully employed in the treatment of indigestion, dyspepsia and all bowel and kidney complaints.—*Ber. d. Deutsch. Chem. Ges.*, xii, 1789, p. 2111.

Mikania Guaco, HBK., was first recommended by an Indian to Mutis (1788) as a prophylactic for snake bite; soon after its juice and a tincture of it were used for intermittent fever, rheumatism, gout, cramps, hydrophobia, syphilis, old sores, and cholera; it was soon, however, almost forgotten until Dr. G. van Schmitt, a Dutch physi-

cian, recently revived its use by employing it, in connection with other substances, for cancer, claiming wonderful curative properties for it, which, however, are considered doubtful by Hager. The leaves and stems of the plant are usually used in the West Indies, and have an unpleasant, aromatic, bitter taste; the leaves and stems of *Mikania saturejæfolia*, Willd., are considered equally efficacious.—*Pharm. Centralb.*, Nov. 20, 1879, p. 438.

The Efficacy of Koosso resides, according to Professor Arena, not in koossin but altogether in the green, slightly bitter resin, which is soluble in alcohol and ether. It is contained in the fresh powder, but on exposure to air turns yellow and loses its bitterness and medicinal efficacy.—*Pharm. Ztschr. f. Russl.*, Nov. 1, 1879, p. 655, from *Allg. Med. Centr. Ztg.*

Morphia tartrate has been recommended by Erskine Stuart as a morphia salt particularly suitable for hypodermic injections, because more concentrated solutions can be obtained of it than of the muriate or acetate. It is very soluble in water and alcohol, forms neutral, wart-like crystals consisting of needles, and is made by dissolving 10 grams crystallized morphia and 2.5 grams (or sufficient) tartaric acid in 40 grams hot distilled water, and evaporating in a moderately warm place.—*Pharm. Centralb.*, Nov. 20, 1879, p. 434.

Characteristic Tests for Papaverina and Codeia.—I. *Papaverina*.—S. Tattersall heats the substance to be tested with a few drops of sulphuric acid until dissolved, adds a small piece of arseniate of sodium and heats again over a small flame; the solution soon turns wine-red, and finally, as soon as sulphuric acid vapors begin to escape, dark blueish-violet, this color is very permanent. After cooling, about 10 cc. of water are added; the now orange-colored liquid is poured into a bottle, diluted, and caustic soda added until slightly alkaline, when the liquid turns very dark—almost black. Other alkaloids—like strychnia, brucia, morphia, salicin, atropia, narcotia, narceia, digitalin, picrotoxin, curarin, colchicia and cantharidin—turn light-orange or dirty-yellow on the addition of alkalies.

II. *Codeia*, heated with sulphuric acid and Na_3AsO_4 , yields a dark blue coloration—much darker than that produced by ferric chloride under the same circumstances. On the addition of water and alkalies it turns orange, which is a characteristic reaction of this alkaloid.—*Pharm. Ztschr. f. Russl.*, Dec. 11, 1879, p. 721, fr. *Chem. Centralbl.*

Scillain, was isolated from *Urginea scilla*, Steinh., by E. v. Jarmersted as an amorphous white powder. It is a glucoside; does not contain nitrogen; is scarcely soluble in water, but readily soluble in alcohol; yields sugar when boiled with dilute acid, and acts sufficiently poisonous in the dose of 1 or 2 milligrams to kill dogs and cats.—*Ber. d. Deutsch. Chem. Ges.*, xii, 1879, p. 2165, fr. *Arch. f. exper. Pathol. u. Pharmacol.*

Emetia.—Podwissotzki obtained from ipecacuanha $\frac{3}{4}$ to 1 per cent. of pure emetia, in fine tabular crystals, on the slow evaporation of ethereal or alcoholic solution. Emetia is soluble in about 100 parts of water, more readily soluble in ether, chloroform and fats; has a strong alkaline reaction; forms salts with acids, which were not obtained in crystals; melts at 62 to 65°C.; is precipitated from solutions of its salts by alkalies and alkaline carbonates in an amorphous state, and somewhat resembles colchicia in its therapeutical action.—*Ibid.* fr. *Ibid.*

Elais guineensis.—According to H. Soyaux, the well-known botanist of the German Expedition to Southwestern Africa (1873–1876), the oil-palm is indigenous to all parts of Western Africa, and is the most attractive specimen of African vegetation. It is known to the native negroes as “m-ba,” and to the Portuguese as “palmeira de azeite.” An idea of its usefulness may be approximately formed when it is considered that a tree yields annually one gallon of palm-oil. This fat is orange-yellow, a little softer than green soap, and is obtained by subjecting the fruit to a fermentation by burying it for about 30 days in the ground, then removing the fleshy portion, which has become comparatively loose by this time from the hard kernels, melting, removing the coarse impurities, and cooling. It is then packed and sent to the European factories, where the oil is again melted in large kettles, allowed to settle, and the pure oil is decanted. According to Livingstone, the oil is obtained by boiling the fruit, contusing in a mortar, treating with water, and separating the supernatant oily layer. Other authors state that the fruit is contused before boiling. The seeds of the oil-palm are as hard as horn, have a grayish-blue semi-transparent color, the size of a hazelnut, contain also a large percentage of fat, which is expressed in Europe, and are exported from all ports which export palm-oil, in bags woven from the split leaves of the *Hyphæna* palm; they are known to the Portuguese as “coconotte.”—*Pharm. Handelsbl.*, Dec. 17, 1879, p. 51.

Adulteration of Codliver Oil.—A Dutch journal contains an account on codliver oil adulterations. The oil is stated to be frequently adulterated in Norway with the oil of the liver of *Scymnus borealis*, a fish belonging to the shark family, found in large numbers in the Arctic Ocean, the northern portion of the North Sea and along the west coast of Norway. The largest of these fishes yield $1\frac{1}{2}$ to 2 casks of liver, the oil of which is fully as bright and clear as codliver oil, contains little stearin, is cheaper, almost equally as efficacious, but has a very disagreeable taste. The fat of the marine mammalia is also frequently used for sophistication, but rarely in Norway. It contains very little fatty acid, and is with difficulty digested.—*Ibid.*, Dec. 3, 1879, p. 49.

Production of Codliver Oil in Norway in 1879.—(For production in 1878 see "*Amer. Journ. Pharm.*," April, 1879, p. 194.) L. Monrad Krohn reports that the catching of codfish and the preparation of the oil give employment to a larger number of fishermen every year; that the total quantity of medicinal oil exported from Bergen in 1879 was about 3,600 hectoliters (=3,100 casks) white oil prepared by steam; 15,000 hectoliters (=13,000 casks) yellow medicinal oil, and 6,000 hectoliters (=5,000 casks) brownish-yellow oil. The white oil is prepared with constantly increasing care. The brownish-yellow oil is exported for medicinal purposes principally to Belgium and Holland.—*Ibid.*, p. 50.

Production of Iodine in Norway.—150 kilos of first-class iodine, the first manufactured at a new laboratory at Bergen, was recently exported to Germany. L. Monrad Krohn expresses the opinion that Norway, with its extensive sea coasts, rich in laminarian species, will undoubtedly soon produce an immense quantity of iodine.—*Ibid.*

PREPARATIONS OF WHITE QUEBRACHO BARK, (*Aspidosperma Quebracho*).

BY DR. BURGOS.

The following extract from a thesis by the author appears in the "*Revista Farmacéutica*" (Buenos Ayres), for November.

Powder of *Quebracho Blanco*.—Possesses all the physical and organoleptic properties of cinchona powder; in color it is intermediate between the red and yellow barks. It is prepared in the same manner

and can be used for the same purposes, pharmaceutically, as an antiseptic alone or mixed with wood charcoal, or as an ingredient in dentifrice powders, electuaries, etc.

Infusion.—The infusion is similar to sherry in color, clear and transparent. It has a bitter taste, analogous in every respect to that of an infusion of cinchona, but more pronounced. It is prepared with the same proportions as the decoction.

Decoction.—Quebracho bark, bruised, 1 part ; water, 20 parts. Dr. Mantegazza prepares it in the proportions of 1 to 12 or 18. The decoction is more intense in color than the infusion, and if it be concentrated so as to reduce it to one-third it acquires a color as deep as that of port wine. It remains clear whilst kept at an elevated temperature, but as it cools it deposits an abundant precipitate. A few drops of sulphuric acid restore partially its transparency by dissolving the alkaloid it contains. If added to a solution of sulphate of iron a very large quantity of greenish-grey precipitate is produced. With ammonia it undergoes no alteration.

The decoction is used as a tonic and febrifuge and it is the form in which quebracho is administered in the provinces where paludal fevers prevail.

Digestion.—Made with sulphuric or acetic acid in the proportions indicated for the preparation of the alkaloid according to Fraude's method. At the end of four to six days it is as intense in color as the concentrated decoction and has a much more bitter taste, as it contains much alkaloid in solution.

It can also be prepared for internal use with a smaller quantity of sulphuric acid.

Tincture.—Quebracho bark, bruised, 1 part ; alcohol, 56°, 5 parts. Macerate during eight days and filter. (This formula corresponds to the tincture of cinchona of the Codex).

Compound Tincture.—Quebracho bark, bruised, 2 parts ; orange peel, 1 part ; alcohol, 56°, 15 parts.

Wine.—Quebracho bark, bruised, 1 part ; alcohol, 56°, 2 parts ; white wine, San Juan or Mendoza, 16 parts. Leave the alcohol in contact with the bark during twenty-four hours, then add the wine, macerate for eight days and filter. The use of one or other of these wines is recommended because they contain little tannin and possess a special aroma that communicates an agreeable flavor to the preparation.

An *Elixir*, very pleasant to the palate, is made by adding sugar to this preparation.

Extracts.—Both the aqueous and alcoholic extracts may be prepared by the ordinary processes.

Syrup.—Quebracho bark, 3 parts ; water, 32 parts ; sugar, 16 parts. Boil the bark with the water, filter and evaporate down to the fourth part, add the sugar and make the syrup *secundum artem*.

Preparations with the Alkaloid.—Aspidospermin or quebrachin is insoluble in glycerin. It dissolves readily in fats and fixed oils, and may be incorporated with codliver oil in larger proportion than quinia. The following is a suitable formula :

Codliver oil, 100 parts ; aspidospermin, 6 to 8 parts ; dissolve with the aid of heat. It is easy to conceive the usefulness of such a preparation as this, in which the special properties of the oil are joined with those of the alkaloid, and which in small doses acts as an eupeptic.—

Phar. Jour. and Trans., Dec. 20, 1879.

NOTE ON ERVUM ERVILIA, THE BITTER VETCH.

BY WILLIAM SOUTHALL, F.L.S.

In the *Journal* for April, 1873, was given the result of a trial at the Birmingham County Court, as follows :

“An action has recently been brought to recover damages alleged to have been sustained by the death of fifteen pigs, caused by eating adulterated meal supplied by the defendant. Evidence was given that the stomachs of the dead pigs presented symptoms of irritant poisoning. Dr. Hill, the borough analyst, said that he had analyzed a portion of the meal, and had been unable to detect any trace of poison, but that there was some sand present, to which, perhaps, the inflammation was due. For the defence, chemical evidence was given by experts that the meal contained no poison. The judge decided in favor of the defendant, expressing an opinion that the deaths resulted from the improper manner in which the food was given.”—*Birmingham Gazette*.

This trial occupied two days, and twenty-four witnesses were called. My firm was employed by one of the several parties interested to analyze the meal, but, the result being negative as regarded the ordinary poisons, was not called upon to give evidence. The hypothesis

relating to the proper cooking of the meal was raised by my ingenious friend, the late Alfred Bird, who suggested that the meal being mixed with cold water, lumps of starchy coagulate were formed, which were totally indigestible, and so caused death; whereas, had the meal been properly cooked with hot water, it would have been soluble, and no harm would have resulted. In this view he was followed by a professor of Materia Medica and by a professional chemist. The manifest effect of the food was severe vomiting, followed by speedy death. The judge delivered an elaborate judgment, in which he said he laid no claim to practical knowledge in feeding pigs, but he adopted the view, and gave a verdict for the defendant. It will presently be seen that this view was in the direction of the truth, but was quite erroneous.

Being interested in the subject, and desirous of solving the obscurity in which it was left by the trial, I procured some of the seeds of which the so-called pea meal was made, and found that they had been called Egyptian peas, but that they were really very much smaller than peas, and that the correct name was Rovi seed, a cargo of which had been imported from Turkey. These I sowed in my garden; they sprang up, flowered and bore fruit, and proved to be the *Ervum ervilia*, or bitter vetch. I sent a specimen to Prof. Oliver, at Kew, who confirmed the name. The mystery was now made clear, as these seeds are known to be poisonous.

Since that period, I have heard of several cases of pigs being poisoned, but could not obtain the seeds of which the meal they were fed upon was made. During the last summer, however, a number of pigs were poisoned at Stratford-on-Avon, and on examining the seed I found it to be about half Rovi-seed and the remainder a black tare, or vetch, a much larger seed. It therefore seemed to me desirable that a statement of these facts should be published for the sake of the pigs, and, possibly, for that of men.

The seed of *Ervum ervilia* is about the same size, and almost exactly the same rufous-brown color as that of the Egyptian lentils (*Ervum lens*), and when the testa is removed they are both of an orange-pinkish color, but the former is not so bright as the latter. The seeds of *E. ervilia* are not, however, lenticular, but are obtusely triangular, and this serves to distinguish them from lentils, for which popular food they might be an unpleasant substitute.

Modern writers do not take much notice of *E. ervilia*; it is by sev-

eral simply mentioned as poisonous. Lindley, in his "Vegetable Kingdom,"¹ says that the seed mixed with flour produces weakness of the extremities, and render horses almost paralytic. J. C. Loudon² attributes these same qualities to *Lathyrus sativus*, but his figure of *L. sativus* is that of *L. aphaca*, so there may be some confusion with both writers. Sir John Hill, whose "Herbal" is dated 1756, dismisses it as a plant having no properties worthy of notice; but if we go back another hundred years we find it to be an article of the *Materia Medica*, and that it had the credit of curing the Emperor Augustus, "whose grieve it is probable was a toughe flegme condensate in the lungs, and and hard to be avoyded and spit forth."

In those well-known books, Gerarde's "Herball"³ and Parkinson's "Theater of Plantes,"⁴ the bitter vetch and its virtues are fully described, and the same engraving does service in both. The name given is *Orobus receptus herbariorum*; and it is curious to observe how the properties attributed to it by Galen and the older writers are quoted in every book of this and of anterior date, except Celsus, that I have consulted. After the old fashion it is said to be hot in the first degree and dry in the second. Gerarde says that "men do altogether abstain from the bitter vetch, for it hath a very unpleasant taste and naughty juice; but kine in Asia and in most other countries do eat thereof, being made sweet by steeping in water." It is directed to be given as a medicine with honey as an electuary.

In the "Commentaries of Matthioli upon Dioscorides,"⁵ a book of about the same date, we find that there was then considerable controversy as to the true identity of *Orobus*, *Ervum* and *Ervilia*, and which of the plants known to the ancients were meant by those names. He quotes Galen, "*Boves apud nos ut apud alios plerasque gentes Ervo in aqua edulcato pascuntur; hominum cibis prorsus hoc semen damnatur, est enim insuavissimum, et pravi succi.*" In Bauhinus' great work, "Historia Plantarum,"⁶ the difficulty is still further worked out, one suggestion being that *Ervilia* must be the same as *Phaseolus*, the kidney-

¹ Lindley's "Vegetable Kingdom," 1853, p. 548.

² Loudon's "Encyclopedia of Plants," 1836, p. 620.

³ "The Herball," J. Gerarde, 1636, p. 1225.

⁴ "Theatrum Botanicum," J. Parkinson, 1640, p. 1079.

⁵ P. A. Matthioli, "Opera," 1674, p. 343.

⁶ Bauhini, etc., "Historia Plantarum," 1651, tom. ii, p. 296.

bean, because that is the only legume of which men eat the pods and seeds together. It is even suggested that it may be *Dolichos*. He says that Brasevolus believes *Ervilia* to be the legitimate *Ervum*, but the more general testimony appears to be that it was a different plant, known to the Greeks as *Ochros*. One species of *Orobos* is spoken of as *Orobos semine obtuso triangulo*," and this answers well to our bitter vetch.

An interesting clue to the name *Ervum* is given. "*Qudd verò Erbum Avicennæ (Orobon Græci appellant nos Ervum)*." I may say that it appears to me that the name *Rovi* is also clearly derived and descended from *Orobos*, it being probably grown on some shores of the Greek Archipelago. Whilst this note has been passing through the press my attention has been called to the "Gardeners' Chronicle" of December 13, where it is mentioned that Dr. Whittmack recently exhibited some carbonized leguminous seeds, disinterred in the ruins of Troy by Dr. Schliemann, which, on careful examination, proved to be the seeds of *Ervum ervilia*.

A hundred years further back than Bauhinus, we meet with a mention of *Ervum* in the works of our first English botanist of repute,¹ William Turner, 1551, printed in black letter, with beautiful plates. He says: "Bitter fiche burdeneth the hede mych, the same eaten troubleth the belly. It draweth out bloude by the water. This pulse well sodden maketh oxen fatt. *Ervum* helpeth a mā to pis well. The same maketh a man haue a good colour." He is exercised as to the identity of the plant; scolds Fuchsius for misleading him, and gives for his engravings a species of *Lathyrus*, which he calls *Orobos Sylvestre*.

We now get back to the ancients. I have not Galen to refer to. Celsus¹ mentions both *Lenticula* and *Ervum*, and his editor, Dr. Milligan notes the first to be *Ervi lentis*, L., *varietas major*, the second *Ervum lens*, L.; but if the Latin "*Ervum*" be the same as the Greek "*Orobos*," this would be incorrect. Pliny,³ writing soon after, mentions the twenty virtues ascribed to it, including its curing the bite of serpents—and of men—and also adds that if sown in March it is injurious to oxen, if in autumn it produces headache, but if sown in early spring it produces no bad results; but Pliny does not discriminate his facts. Dr. Bostock, his editor (Bohn's edition), says in a note that the

¹ "A New Herball," W. Turner, 1551, sheet p. iii.

² "A. Com. Celsi Medicinæ," etc., 1831, p. 197.

³ "Natural History of Pliny," Bohn, 1856, vol. iv, pp. 51-451.

blade is said to be poisonous to pigs, and that the farina of *E. ervilia* is much advertised as a food; but Revalenta is now supposed to be the farina of *Ervum lens*.

Having now traced the history of the Rovi seed of the Archipelago up to the Orobis of the ancient Greeks, let me return to its poisonous properties. The ancients and those accustomed to use it knew that these could be eliminated or destroyed, by soaking in water, as is the case with other vegetable products which are poisonous in their natural condition, but which are made wholesome by water, by heat, or by both combined. This property may reside in the testa, which is the most bitter part, so that when decorticated, the seeds would be wholesome, but I am not aware if this be the case or not.

It has been stated that sheep may feed on the Rovi seed. On the other hand, pigs, notwithstanding they are such gross feeders, have delicate stomachs; it is said they cannot eat even haricot beans with impunity. They are probably modified by the artificial life they lead. Darwin¹ says that white sheep and pigs are injured by certain plants, whilst dark colored individuals escape. In Florida, the squatter selects the black members of a litter, as they only have a good chance of living—as the pigs eat the paint root (*Lachnanthes*), which colors their bones pink, and causes the hoofs of all but the black varieties to drop off.

At the trial it was stated that one of the witnesses offered the meal to some pigs who declined to partake of it; he kept them without food all day, and offered it again, but they still declined. Whether these pigs were black or not was not stated, but it would appear that their original aptitude for discernment in the selection of proper food had not been destroyed by their artificial mode of living—whatever their original physical capacity might have been. Light colored pigs certainly have a much more objectionable appearance than black; their skin is too much the color of the noble biped to look correct. One witness stated that she had given the meal to her pigs without harm, but that she had only given a small proportion with other food and had first well steeped it in accordance with the ancient custom.

I fear this subject has been treated too much at length, but it is certainly one of importance to the porcine world, and if an occasional cargo of Rovi seed is imported we do not know where it may find its way.—*Phar. Jour. and Trans.*, Dec. 20, 1879.

¹ Darwin's "Origin of Species," 1869, p. 13.

COMPOSITION OF SOME VOLATILE OILS.

BY BRUYLANTS.

Oil of marjoram, obtained by distilling the flowery tops of *Origanum Marjorana* in a current of steam, is a yellowish liquid, when freshly prepared (sp. gr. 0.911 at 15°), but becomes brown on standing. It has a pungent smell and a hot, peppery and slightly bitter taste. It is a dextrorotatory, and has an acid reaction. When distilled, it begins to boil at 185°, but the temperature rapidly rises to 200°, and remains constant between 215 to 220°, a resinous mass being left in the retort.

By repeatedly fractioning the oil which passes over at 185–190°, a portion is obtained, boiling between 160–162°, consisting principally of a terpene.

The fraction boiling at 215–220° yields no portion having a constant boiling point, nor does it deposit crystals when cooled to – 25°. Its vapor density and analysis correspond with either laurel camphor or borneol. When distilled with phosphoric anhydride, it yields a mixture of cymene and terpene (b. p. 160–170°). When treated with acetic anhydride, it forms a compound (b. p. 230–235°), which with alcoholic potash yields terpene and potassic acetate. Chromic mixture oxidizes it with the formation of acetic and formic acids and laurel camphor.

Oil of marjoram is therefore composed of a dextrorotatory hydrocarbon, 5 per cent.; a mixture of dextrorotatory camphor and borneol, 85 per cent.; resin, 10 per cent.

Oil of lavender when freshly prepared is a colorless liquid, which becomes yellow on standing; it smells of lavender, and its taste is hot, camphorous and slightly bitter. It is lævorotatory, has an acid reaction, and sp. gr. 0.875 at 15°. It begins to boil at 185°, the temperature quickly rises to 190°, and the greater portion distils over between 195–215°. The first portion of the distillate consists of a mixture of acetic and formic acids, but contains no valeric acid. By repeated fractionation, a lævorotatory terpene (b. p. 162°) is separated, capable of forming a crystalline hydrochloride. The essence also contains a mixture of camphor and borneol; this mixture forms an acetate (b. p. 230°), which is decomposed by potash, yielding a terpene and potassium acetate. When it is distilled with phosphoric anhydride, a hydrocarbon is obtained, consisting for the most part of terpene, and containing also

some cymene. Essence of lavender consists of terpene, 25; borneol ($\frac{4}{5}$) and camphor ($\frac{1}{5}$), 65; resin, 10 per cent.

Oil of Spike.—This oil, obtained from *Lavandula spica latifolia*, is a colorless liquid, which in time thickens and darkens in color. It has an acid reaction, and sp. gr. 0.9081 at 15°. Its odor resembles that of lavender. Its composition is almost identical with that of essence of lavender, but, as it contains more hydrocarbon, it begins to boil at 170–175°. It is lævorotatory. Its composition is as follows: Terpene, 35; borneol and camphor, 55; resin, 10 per cent.—*Jour. Chem. Soc.*, Jan, 1880, p. 50.

BEHAVIOR OF CYMENE IN THE ANIMAL ORGANISM.

BY JACOBSEN.

As cymene has been prepared from normal propyl iodide and parabromotoluene, and as the author has shown that the hydrocarbon produced from parabromocumene and methyl iodide is not cymene,¹ but an isomeride, no doubt would remain regarding the constitution of cymene were it not for two reactions. The first of these, noticed by Kraut and confirmed by the author, is that cymene is produced by the action of zinc dust on cymyl alcohol, and the second is the oxidation of cymene in the organism to cuminic acid, observed by Nencki and Ziegler. Both of these results are unfavorable to the theory that cymene contains a normal propyl group. In the present paper, the author gives an account of a repetition of Nencki and Ziegler's experiments.

The cymene was administered to a dog, and its urine, after evaporation, was acidified and shaken with ether. After distilling off the ether, the residue gave a copious precipitate with hydrochloric acid, which was found for the most part to consist of cuminuric acid, $C_{12}H_{15}NO_3$. The filtrate from this precipitate gave a distillate containing a little paraxylylic acid, showing that the cymene administered to the dog had contained a little pseudocumene.

Cuminuric acid melts at 168°, and volatilizes without decomposition. It is almost insoluble in cold, but comparatively easily soluble in warm water; it dissolves with the greatest readiness in alcohol; ether, how-

ever, dissolves it with difficulty. From water it crystallizes—(1), on addition of an acid, in nacreous scales, and (2) on slow evaporation, in large iridescent rhombic plates, without water of crystallization, and from alcohol, on evaporation, in radiated crystals.

The *barium salt*, $\text{Ba}(\text{C}_{12}\text{H}_{14}\text{NO}_3)_2 \cdot \text{H}_2\text{O}$, dissolves with some difficulty, and crystallizes from its hot solution in long right-angled plates or in flat needles, arranged in a fan-shaped form. The *calcium salt*, $\text{Ca}(\text{C}_{12}\text{H}_{14}\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$, crystallizes in thin needles, and is also soluble with difficulty. The *ammonium* and *potassium salts* are very easily soluble, and crystallize in needles. The two latter salts give precipitates with salts of zinc, manganese, cadmium, magnesium, ferrous and ferric salts, copper, lead and silver; with mercuric chloride, it gives no precipitate, and with mercuric nitrate, a flocculent insoluble precipitate.

This cuminuric acid probably differs from that which Cahours prepared from cuminic chloride and glycolyl silver.

In order further to confirm the relations of this acid, it was decomposed by heating with hydrochloric acid; it split up into glycocine and cuminic acid, melting at $116-117^\circ$, and agreeing in all its properties with that described by others. It thus appears that cuminic acid is really a product of oxidation of cymene in the animal organism, but to remove all doubt, and further to connect cuminic and cuminuric acids, the latter acid was synthetically prepared from cymyl alcohol and glycol silver. The product was identical in all respects with that separated from the urine.

If, then, there is conclusive proof that cumene contains normal propyl, and that cuminic acid contains isopropyl, then the preparation of cumene from cymyl alcohol with zinc dust involves the transformation of isopropyl into normal propyl, and, on the other hand, the formation of cuminic acid from cymene implies the opposite change.

In conclusion, the author draws attention to the fact that in his experiments the chief product was cuminuric acid, whilst in those of Nencki² and Ziegler cuminic acid was formed. He also found the latter acid, but in very small amount.—*Jour. Chem. Soc.*, Jan. 1879, fr. *Jour. Phar.* [4], xxx, ps. 30-35, 139-141.

THE PRESERVATION OF ANIMAL AND VEGETABLE TISSUES.

Mr. Wickersheimer, anatomical preparator at the University of Berlin, has discovered a preserving fluid, by means of which dead animals may be preserved in contact with air without losing their natural appearance, softness and flexibility. Human corpses have by its means been kept for months, retaining during this time the flexibility of the joints and an almost lifelike color. The lungs of different animals which have been immersed in the liquid may be dried, resembling then a shrunken dark-brown body, which, by means of bellows, may be inflated as during life-time, and acquire then a fresh red color, closely resembling a fresh lung in appearance. Even old skeletons of various fishes which had been prepared with the cartilages belonging to them, had their natural flexibility restored after being immersed in the liquid for some time.

The liquid is also adapted to the preservation of small animals, and of fungi, algæ, flowers, fruits and other parts of vegetables.

The formula for preparing this liquid has been purchased by the Prussian government and published by order of the minister of education. The directions are as follows :

100 grams of alum, 25 grams of sodium chloride, 12 grams potassium nitrate, 60 grams potassium carbonate (Potasche) and 10 grams arsenious acid are dissolved in 3000 grams (3 liters) of boiling water ; the solution is allowed to cool, filtered and to every 10 liters of the neutral colorless and inodorous liquid are added 4 liters of glycerin and 1 liter of methylic alcohol.

Anatomical preparations and animals which are to be kept in the dry state are immersed in the liquid, according to their size, for from 6 to 12 days, and afterwards dried simply by exposure to the air. The tendons, muscles, etc., remain soft and flexible, so that all natural movements may be readily made. Hollow organs like lungs, entrails, etc., are filled with the liquid before immersion, and subsequently inflated and dried. Smaller animals, like crabs, beetles, lizards, frogs, etc., also vegetables of which the natural colors are to be preserved, are kept in the liquid. Corpses and animal carcasses may be preserved by injection, for which purpose from $1\frac{1}{2}$ to 5 liters are required ; on cutting the flesh then, even after years, it has the same appearance as that of recent corpses. The epidermis of injected bodies gradually becomes some-

what brown, but even this may be prevented by rubbing the skin with the solution, and keeping the body as air-tight as possible. For embalming injection is to be combined with immersion, and to be followed by wrapping the corpse in cloths moistened with the liquid and by placing it in well closed receptacles.—*Die Gartenlaube*, Nos. 22 and 50, and *Phar. Ztg.*, Oct. 29.

At a recent meeting of the Academy of Natural Sciences, Philadelphia, Mr. Wm. Barbeck directed attention to Wickersheimer's preserving fluid, and communicated the above formula. An interesting discussion arose, in which Messrs. Leidy, Roberts, Potts and Kingsley participated.

Dr. Leidy stated that the liquid which had been used by Dr. Horner and himself for years in the University for the preparation of anatomical subjects was almost identically the same as the Berlin mixture described by Mr. Barbeck. It was simply a modification of the fluid used in the West for the preservation of hams, arsenious acid being substituted for the starch of that mixture. Its use in the University had been attended with the most satisfactory results. In this liquid, we have been informed, methylic alcohol is always omitted, carbonate of potassium is considerably reduced in quantity, being merely sufficient for dissolving the arsenious acid, glycerin is added only for some special purposes, and the other ingredients are employed in somewhat different proportions from those given above.

J. M. M.

ALEURONE.

Aleurone has recently become the object of a certain amount of interest, and was not long since the subject of a question at one of the University examinations. Nothing, however, has yet been published respecting it in this journal, and very little in this country. The following notes, compiled from various works, have been supplied by Mr. Marshall Leigh :

Aleurone grains were discovered by Hartig in 1855 ; their importance, however, was not generally acknowledged until Dr. Pfeffer published his researches in 1872 (*Jahrb. f. wiss. Bot.*, 1872). These researches are still the standard work in Germany, and contain a larger amount of reliable information than any other.

The reservoirs of ripe seeds, the endosperm and cotyledons, always

contain aleurone together with starch and oily matter. If the seeds contain much starch, as in the chestnut, the aleurone grains occupy the interstices and consist of minute granules; in oily seeds, however, the granules are found in the place of starch.

Their formation commences when the seeds have attained their last condition of ripeness and the funiculus become sapless; the seed loses water by evaporation, the mucilaginous mass in its interior gradually becoming firmer, and the grains of aleurone separate from the turbid matrix.

The origin of the grains is therefore simply a dissociation which arises from loss of water; on germination, the cells absorb moisture, and the aleurone grain again unites with the matrix.

The matrix surrounding the grain may be considered as the protoplasmic mass of the cell, in which water is replaced, on drying, by oil or starch.

The use of aleurone is to act as a reservoir of protein, in the same way as starch and oil globules are reservoirs of hydrocarbons, the protein being the source from which the protoplasm of the young plant is formed upon germination.

Occasionally the grains are seen to have a crystalline appearance, due to their enclosing crystals of oxalate of calcium; more frequently, however, they contain non-crystalline and clustered granules of a double phosphate of calcium and magnesium mechanically enveloped during the contraction of the protein.

Aleurone grains are absolutely insoluble in alcohol, ether, benzol or chloroform; they are mostly soluble in water, and can by that means be separated from the enclosed crystals or globoids.

Their chemical composition has recently been made the subject of observation by several chemists. In 1872,¹ Ritthausen exhausted the seeds by alkaline solutions and demonstrated the presence of vegetable caseins, such as legumin and conglutin.

In 1877,² Weyl published some observations which tended to show that the proteids existed as globulins, and that the caseins extracted by Ritthausen were the products of alteration caused by his alkaline solutions.

¹ "Die Eiweiss-Körper der Getreidearten," 1872.

² "Zeitschr. für Physiol. Chemie," 1877.

Mr. Sidney Vines¹ has lately contributed an article to the Royal Society which in many respects confirms Weyl's observations.

An extract of the seeds of blue lupin (*Lupinus varius*) in common salt was found to contain two proteids belonging to the group of globulins and hitherto known to occur only in animals: myosin, a constituent of dead muscle, and vitellin, a constituent of the yolk of egg; these two substances, vegetable myosin and vegetable vitellin, were found to have exactly similar reactions to the animal substances of the same name.

An aqueous extract of the seeds contained another proteid having all the properties of peptone, and agreeing very nearly with the *a* peptone of Meissner, or hemialbumose of Kuhne,² an easily decomposable peptone formed by the action of gastric juice on proteids.—*Phar. Jour. and Trans.*, Nov. 22, 1879.

THE MIGRATION of PLANTS from EUROPE to AMERICA, with an ATTEMPT to EXPLAIN CERTAIN PHENOMENA CONNECTED THEREWITH.

BY PROF. E. W. CLAYPOLE, B.A., B.SC. (London), of Antioch College, Ohio.

Paper read before the Montreal Horticultural Society, 1877.

Underneath the great wave of human emigration from the so-called Old to the so-called New World, underneath the noisy, busy surface tide that has swept westward from the shores of Europe to those of America during the last two hundred years, there has existed another and a less conspicuous wave, another and a less prominent tide of emigration. Westward in its direction, like the former, it has silently accomplished results that seldom strike the superficial eye, but yet are scarcely less in magnitude than those which have followed the advent of the white man to the shores of America.

I allude to that slow and noiseless immigration of European plants which has been going on for many years, and which probably commenced when the first European vessel touched our shores. Side by side with the displacement of the red man by the white man has gone on the displacement of the red man's vegetable companions by plants which accompanied the white man from his trans-Atlantic home. Not more completely have the children of the Pilgrim Fathers made themselves at home on the banks of the Charles and the Neponset, not more completely have the successors of Champlain and Jacques Cartier established themselves along the St. Lawrence, not more completely have the descendants of the aristocratic colonists of Maryland and Virginia appropriated the shores of the Chesapeake, than have the

¹ "Proc. Roy. Society," December 19, 1878.

² "Verhandl. d. Nat. Med. Vereins zu Heidelberg," 1876.

homely weeds of England and France made themselves at home in the New World ; established themselves on its soil, appropriated its fields, its gardens and its waysides. Nor have the older States alone been seized by these European invaders. The stream has flowed beyond them, and as no village or hamlet in the West is without its population of European descent, so too it is never without its plant population of European weeds. To the American, born and reared among them, these things have none of the significance which they possess to him who comes across the Atlantic, conversant with the flora of Europe, and anticipating a complete change of plant life as well as of place and scene after voyaging 3,000 miles. And yet I scarcely know which strikes the thoughtful stranger most, the resemblance or the difference between the Old which he has left or the New to which he has come. Differences, of course, there are, many and great, but in the face of the fact that the new country with its millions of inhabitants is using the same language and laws and customs as the old country he has so lately left, they are less striking. The same is true of the American flora. The writer will never forget the impression made on his own mind when soon after landing in America he set to work upon the botany of his new home. The summer, with its floral treasures, had gone by and the brilliant New England foliage told that winter was rapidly approaching. In the woods and shrubberies the falling leaves revealed new types of tree-life mingled with old forms well known in England. But on the ground, in the fields, along the waysides and fences were many well-known plants. Old acquaintances, friends and foes both, which he had years before learned to know—sometimes to cherish and often to uproot—when a boy in the old country. So far was the flora from being totally new that sometimes he was puzzled to know whether, on a given space, there were more strange or familiar forms around him. This result was quite unexpected and opened before him a new and very interesting field of observation and investigation, which has continued ever since to occupy at intervals his attention. The fact here mentioned—this migration of European plants into America—became all the more striking when, after a longer residence in this country, and a further study of its flora, he looked back to his earlier botanical studies in Europe and observed that this vegetable migration is almost entirely in one direction. In the midst of this rich flora, aliens by origin, but naturalized by the letters patent of time, he looked back to his old home and tried, but almost in vain, to recall American forms of plant life naturalized there. Scarcely a solitary specimen could be found to which the Old World, always chary of conferring its citizenship upon foreigners, could be said to have given the rights to home. Whence comes this striking difference ? Why is the Western World so hospitable and the Eastern so inhospitable to vegetable strangers ? Is it that these western strangers do not claim naturalization ? Do they feel their inability to make way against the crowded life of the East, and, therefore, fail in the intenser struggle for existence which marks newer and more highly developed Europe ? The full answer to this question is at present impossible, and the writer desires this paper to be considered merely suggestive. Facts must be gathered before conclusions can be drawn. The field is so vast and the need of patient and continuous observation so great that many years may pass ere a solution

of the problem can be reached. "The harvest is plenteous but the laborers are few."

A few illustrations will show the kind of facts to which this paper is intended to call attention, and the writer's purpose will be fully served if its perusal should incite any who are familiar with European botany to note the occurrence of European species in different localities, and especially if it should lead any to inquire as to the cause which prevents the naturalization of others that can only be raised here under cultivation.

The careful observer will notice foreign plants in all stages of naturalization. Some are at present only cultivated in fields or gardens, others have escaped from the domain of the plough and the spade, and are maintaining a precarious existence among conditions not altogether congenial, and are liable to extermination at any time, by an unfavorable season. Others have a stronger hold and occupy the fence-corner or the wayside, while a number, bolder and hardier, have emerged from these sheltering nooks, and have begun an independent career among the indigenous vegetation, hoping, often in vain, to hold their own against the aborigines of the land. Not a few, more hardy still, or more adaptable in their nature, have altogether cut themselves loose from the cultivated field and the domain of man, have ventured out into open conflict with the denizens of the soil, and emerged victorious from the struggle. By crowding upon them, by stifling them, by appropriating their food, they have succeeded in ousting their antagonists, the rightful heirs, as by similar practices the white man has ousted the red man from his ancestral land, and both now occupy the country often to the exclusion of all save the hardiest of the native tribes.

For example, the Scarlet Poppy (*Papaver dubium*), a weed so common in England that many a wheat field appears one sheet of glowing red when it is in full flower, must have come over to America many times in seed wheat, and is occasionally met with here in the fields, especially in Wisconsin and other northwestern States. Yet outside of these, it has never to our knowledge succeeded in propagating itself. It is quite scarce in America. The Giant Elecampane (*Inula helenium*), the Horeheal and Scabwort of the leech, so renowned among the old herbalists as a remedy in complaints of the chest, is but scantily diffused. The writer has met with it in the east near Boston and in the Island of Montreal, and it is abundant in the west in some parts of Ohio and Indiana.

The English Groundsel (*Senecio vulgaris*), a favorite with the keepers of canary birds, but by no means in equal liking of the English gardener, has failed to establish itself in America. A few specimens may occasionally be met with near gardens, but it shows here none of that reproductive power that makes it in England one of the earliest weeds in the spring, and the latest in the fall.

The Salsify, or Vegetable Oyster (*Tragopogon porrifolius*), a native of the Mediterranean region, but established in a few places in the south of England, whence it was probably imported, is most likely of late introduction, and still on trial, not having found a place in Professor Gray's "Manual of the American Flora." The writer has only found it once near St. Catharine's, in Ontario, in considerable quantities, flowering and apparently bringing its seed to perfection.

The Henbane, a dangerous narcotic (*Hyoscyamus niger*), is sparingly diffused in some places. It may be found in tolerable abundance on Fletcher's Field, near Montreal, showing the same predilection as in England for dunghills and heaps of old bricks and mortar.

The Thorn Apple (*Datura stramonium*), a native of Asia and Europe, where it extends as far north as Sweden, is scantily met with in England, having escaped from gardens, where it prefers similar spots to those chosen by the Henbane. But it has been introduced into this country where, under a new name, "Jamestown (Jimson) Weed," it is only too well known. The American name seems to indicate that it was introduced or first noticed as a nuisance in the neighborhood of Jamestown, Virginia.

The Common Hemp (*Cannabis sativa*), so valued for its fibre, a native of the Caucasus and of the mountains of Northern India, only known in Western Europe in cultivation, and doubtless early brought here for economic purposes, has run completely wild, and may now be found in waste land near human dwellings, from the streets of Montreal and Boston to the west of Ohio, and probably farther still.

The Grape Hyacinth (*Muscari botryoides*), and the Star of Bethlehem (*Ornithogalum umbellatum*), both common English garden flowers, may be occasionally found in the vicinity of Montreal, as if longing, yet fearing, to strike for freedom from the control of man in their new country.

The Corn Cockle (*Lychnis githago*), so mischievous in English wheat fields, is tolerably common here in similar places, but has not succeeded in establishing itself outside of the protection of man. The same may, in the northern districts, be said of the common Red Clover (*Trifolium pratense*). In spite of its deep tap root and rank growth, it is unable to bear the cold, and an occasional severe winter will exterminate it if unprotected, even in cultivated fields. Its near relative, however, the White Clover (*Trifolium repens*) was introduced in early days, and called by the Indians, "White Man's Foot." Longfellow sings in the story of Hiawatha:

"Wheresoe'er they tread, beneath them
Springs a flower unknown among us—
Springs the White Man's Foot in blossom."

This is much more hardy and seldom yields except to the severest frosts. It overruns field and wayside, fence-corner and common, holding its own against even the aborigines, and strangling them out by its tangled perennial roots. Early in the spring it secures such headway that larger and coarser plants are compelled to give way. Its flowers afford the honey bee so rich a harvest that its seeds are surely fertilized, and this double method of reproduction by root and by seed gives it such an advantage in the struggle for existence that it has spread rapidly over the country, and many an American common is as white with its flowers as is an English lawn with daisies. It is worthy of notice that similar results have attended the introduction of this plant into New Zealand. There also it has run wild, and is said to be pushing out some of the native species, among others the hard and stiff New Zealand flax (*Phormium tenax*), which is said to be unable to hold its ground against the strangling roots of the White Clover.

The English Buttercup (*Ranunculus acris*), beloved of English children and poets, especially of the school of Wordsworth, has overrun the northeast, and the writer

has met with it even in the Canadian backwoods, where only a trail through the bush existed, carried doubtless in the hay taken thither to feed the horses and oxen of the lumbermen when driving logs in a Canadian winter.

The Barberry (*Berberis vulgaris*), with its graceful drooping stems and pendant racemes of bright yellow flowers and scarlet fruit, followed the pilgrims to Plymouth Rock, and like them has struck its roots deep in the bleak hill of New England, until now it is far more common in the neighborhood of Boston than in any part of England with which the writer is acquainted.

Every one who has owned or worked a garden in America has made the acquaintance of the ubiquitous Purslane (*Portulaca oleracea*), so fondly mentioned by the author of "My Summer in a Garden" as "pusley," one of his pets which stuck to him so closely that he could not get rid of it. This, the only *valuable* (start not, American gardener, it is even so) plant of its order, is cultivated as a salad and pot-herb; but, transplanted into our soil and under our skies, it has squatted on the land until nothing save constant watchfulness and hoe can prevent its complete monopoly of the garden. It occupies here the place of the sow-thistle in England. Both break off at the surface of the ground as soon as an attempt is made to pull them up, and when the gardener's back is turned both send out a new crop of leaves, flowers and seed, to punish him for his assault. The writer would like to suggest to the Horticultural Society of Montreal the desirability of offering a prize for the best illustrated essay on the means of turning this European immigrant to account in the Canadian and American kitchens. Possibly the surest way of getting rid of it would be to make it useful. Useful plants are seldom so abundant as to be a nuisance.

The Common Water Cress (*Nasturtium vulgare*)—when, how, and by whom introduced we know not—is now so abundant in some places that one is almost tempted to look upon it as a native. Many of the streams of New York and of southwestern Ohio are as thickly set with it as are any of the water-courses in old England.

The Common Parsnip (*Pastinaca sativa*) has run wild in America in fence-corners and along railway banks near Montreal and other places.

The Hemlock (*Conium maculatum*), of Socratic infamy, has taken possession of certain spots, as it does in Europe. The writer has seen acres of it along the banks of the White River at Richmond, in Indiana.

The Ox-Eye Daisy, or White Weed of New York (*Chrysanthemum leucanthemum*), has crossed the Atlantic with hay-seed and so completely monopolized many of the meadows in the Eastern States that they more resemble snowfields than hay-fields when the plant is in blossom. It is slowly spreading west and south, and last summer the writer found it in Ohio close to the State line of Indiana, appearing in full vigor and of large size.

The Tansy (*Tanacetum vulgare*), valued by herbalists as a tonic, is not uncommon. The crimped variety (*crispum*) grows near Montreal.

The Chicory (*Cichorium intybus*), with its stiff stem and lovely but evanescent azure blue flowers, wild in England and well known to manufacturers of coffee (the genuine article!) is now one of the wild flowers of the Island of Montreal.

The Great Mullein, or Flannel plant (*Verbascum thapsus*), common in waste ground in Europe and Asia, is more common here than in England in similar situations, but never so far as the writer is aware on ground that is truly wild.

The Yellow Toadflax, or "butter and eggs" (*Linaria vulgaris*), has been introduced with crops, and now shows its two-tinted blossoms in gardens and on waysides, and once in is with difficulty eradicated.

The Catmint or Catnip (*Nepeta cataria*), a native of England and southern Europe, is now as common in America. The Burdock (*Arctium lappa*) is another importation from the Old World, "who left his country for his country's good," and has proved like many others who did the same no blessing to his adopted land. Moreover, he has left so many of his kith and kin behind him that his absence is not noticed. Every boy knows the hooked burs or seed vessels of this plant, which cling so closely to the clothes of men, the fleeces of sheep, and the manes of horses that its rapid extension is inevitable.

The Great Celandine (*Chelidonium majus*), with its bright yellow flowers and orange juice, may be found on the eastern seaboard and near dwellings in the inland States.

The Shepherd's Purse (*Capsella bursa pastoris*), a common weed in England, is common in Canada and the States.

The Bladder Campion (*Silene inflata*) spreads its white petals by the roadside, while its little congener, the Mouse Ear (*Cerastium vulgatum*), grows ensconced, as in Europe, in gardens and in fields.

Our list is long enough, but a few remain too common to be completely omitted. Every street and road in many parts of the country is covered with a soft summer-green carpet of the little insignificant Knot-grass (*Polygonum aviculare*). It forms a substitute for grass where grass cannot find a foothold and keeps its ground in defiance of dust and traffic and heat.

Not a few of the European grasses, too, imported for meadows, have escaped from cultivation and succeeded in establishing themselves more or less firmly as occupants of the soil. The little Annual Meadow Grass (*Poa annua*), the Timothy (*Phleum pratense*), the Fox-tail (*Alopecurus pratensis*), the Redtop (*Agrostis vulgaris*), the White Bent (*Agrostis alba*) have become perfectly wild in different places. The Cocksfoot (*Dactylis glomerata*), the Couch or Quick grass (*Triticum repens*) have been less successful. The former apparently dislikes the hot sun of America, though it does well in the shade. The so-called Blue Grass, more properly the June Grass (*Poa pratensis*), of the famous Kentucky pastures, has almost monopolized the ground in many places, and the Chess or Cheat (*Bromus secalinus*) constantly cheats the American farmer into a more than Darwinian belief in the transformation of species, not, by the way, upward, but downward. The Purple Finger Grass (*Panicum sanguineum*), an immigrant from Southern Europe, found but not native in England, may be gathered by the wayside in the Eastern and Middle States. Finally, in some parts of the country the hay betrays to the European by its scent the presence of the Sweet Spring Grass (*Anthoxanthum odoratum*), so well known as giving much of the finest of the fragrance to an English hayfield.

In thus noting instances of vegetable immigration from Europe to America,

another side of the question must not be overlooked. Many common English plants have totally failed to secure a foothold here. The seed of the English daisy must have come over in almost every case of grass-seed that has been imported; yet it has not become naturalized in America. The only instance with which the writer is acquainted of its lasting for several years in a lawn, as in England, occurred in the immediate vicinity of Montreal, and was communicated to him by a friend in that city. It would therefore appear that the heat of summer rather than the cold of winter is the barrier to the establishment in the New World of the "wee modest crimson-tipped flower," so familiar to every British eye. Equally "conspicuous by their absence" are the Primrose and the Cowslip, the flowers of childhood in the old country. Many other instances of this kind might be adduced, but the converse side of the problem now claims attention.

It is singular that while so many European species have forced their way into possession of the American soil, the cases of counter migration are exceedingly few—so few that they may be counted on the fingers. It appears as if some invisible barrier existed preventing passage eastward, though allowing it westward. One or two species may be named which, as exceptions, bring the general truth of this statement into stronger light. The Canadian Fleabane (*Erigeron Canadensis*), a native of North America, "is now established in nearly all temperate and hot countries, and occasionally appears so in England."¹ The Annual Fleabane (*Erigeron annuus*), though not in England, has become wild in some parts of Europe. Add to these two the so-called "Water Thyme" (*Elodea Canadensis*), and we have all the conspicuous examples with which the writer is acquainted of the eastward migration of American plants to Europe and their naturalization there. The last named plant was first observed about 1847 in the northern and midland counties of England and the south of Scotland, in Yorkshire, Leicestershire and near Berwick and Edinburgh.² How it was introduced is not known. Thence it spread until in about ten years many of the slower streams were almost clogged with it, and the writer well recollects that it was then difficult to row on the upper and middle Thames in consequence of the accumulation of this weed. Fears were even entertained that it would form a serious impediment to inland navigation. But in a short time the evil diminished, and after a few years, though still present, the quantity in the rivers became insignificant, and no inconvenience is now caused by its presence.

Such facts naturally suggest the question: Why are these things so? What invisible door bars the passage of the American flora to Europe, but admits the free passage of the European flora to America? One reply will naturally occur. Seed is mainly brought from Europe to America, and thereby a favorable chance is afforded for introducing the seeds of European weeds. This is so; and to this cause, doubtless, is due the immense number of introduced plants. But, if European seed is largely brought to America, American crops go much more largely to Europe; and it would be absurd to suppose that any crop gathered from the half-cleared and weedy fields of this country could be sent thither without, at the same time sending in abundance the seeds of our native weeds. All the ill weeds that

¹ Bentham's "Handbook of the British Flora." ² *Ibid.*

grow in Canada or the States must, ere now, have been many times exported to the mother country. Yet they do not appear. It may be replied that the greater part of the corn crops are destined for the mill and not for the land, and that in this way their chances of propagation are largely diminished. Making all due allowance for this, should we not look for a rank crop of American weeds springing up around the mills from the cleanings and the waste? Yet such is not the case. With all the millions of bushels, moreover, that go to England for feeding purposes, and are never ground, there is the same result. The weeds no more take root and run wild than do the wheat and maize among which they cross the Atlantic. And when, in addition to this, we consider that there has been for two centuries an organized and regular introduction of American wild plants into European botanic and flower gardens, might we not reasonably expect to see at least a few of them, or of others which must have accidentally accompanied them, spreading outside of the limits of these gardens, and becoming naturalized in Europe? Yet nothing of the kind has occurred. Neither the rank and abundant Ragweed (*Ambrosia*), nor the widely diffused Golden Rods (*Solidago*), nor the Protean Asters (*Aster*), nor the wayside Pepper Grasses (*Lepidium*), nor the prolific Sumachs (*Rhus*), nor the clinging Burr-marigolds (*Bidens*), nor the ubiquitous and striking Milkweeds (*Asclepias*), have succeeded in naturalizing themselves in England. Even where a genus contains species on both sides of the Atlantic, as is the case with the Houndstongue (*Cynoglossum*), we find that the English species—the common Houndstongue (*C. vulgare*)—has migrated westward, and become so common near Montreal and almost everywhere in the Eastern and Midland States that Professor Gray can term it “a familiar and troublesome weed”; while at the same time, the common American species, or Beggar-lice Houndstongue (*C. Morisoni*), which the same writer brands as “a common and vile weed,” is completely unknown in England.

Some may be inclined to urge that the comparatively cool English summer may not afford sufficient heat to perfect and ripen the seed, which the fiercer sun and continental climate of Eastern America can easily mature. This may account for the inability of some American species to sustain themselves in England, but it is evidently far from sufficient to solve the whole problem. Many of these plants can perpetuate themselves in the short, cool summer of New England and Lower Canada, and we might therefore reasonably expect, even if want of summer heat excluded them from England, that they would find a congenial climate somewhere in the warmer countries of Southern Europe. But not in England only, but throughout Europe, the absence of American species is remarkable. Difference of climate seems insufficient as the only or the chief factor in the solution of the problem, and we are compelled to look farther.

Nor can it be urged as an objection that European weeds alone have come in. Without at present defining a weed, the reply is obvious that American weeds have not gained a foothold in Europe. It is not to be anticipated that large, conspicuous and slow-growing plants, such as forest trees, or highly developed and cultivated forms, such as garden-flowers, will often run wild. The former require too long a time to grow and propagate themselves, and are subject to too many dangers, while the latter are only maintained at their high standing by constant and careful culti-

vation. It is only, therefore, among the smaller and more insignificant plants that the facts here detailed can be looked for, and accordingly of such our list altogether consists. It may be that the forest trees of Europe, or some of them, will one day grow wild here. But the life of a tree is so long, and its growth so slow, that the experiment cannot be said to have been yet made. So far from planting and propagating European trees, men are bent in most parts of the country upon destroying their own. The present generation has not outgrown that insane hatred of trees which possessed the past, and was perhaps an almost unavoidable result of the severity of their struggle with the primeval forest. Timber is still contemptuously termed "lumber." No respect is felt for it, and consequently no European tree, if trying to run wild, would stand much chance of life during the attempt. A high authority on forest trees in this country has informed the writer that in his experience some European species have grown better than the American species of the same genus—that the English beech and larch, for example, surpassed the native beech and the tamarack. Time alone can prove this point.

The comparison, therefore, must be made, and can only be made justly, between the weeds of the two continents, or plants which come very near them and may be called almost weeds. By the term "weed" we mean those plants to which the surroundings are so suitable that they increase and multiply, year after year, more rapidly than others by which they are surrounded. Entering into details, the soil affords them the nourishment they need; the spring frosts do not kill them, or they bud and grow only when this danger is passed; they ripen their seed in quantity sufficient before the winter sets in; the heat of summer does not scorch them, nor the cold of winter destroy their roots or seeds; they are not so much injured by insects as to preclude their coming to maturity; while their flowers are sufficiently visited by insects to insure the fertilization of their seeds, or else they spread so rapidly by underground stems as to render seed unnecessary. Granted all these conditions, and we have weeds of the first order, while the failure of any one or more of them may reduce such a weed to the position of a very harmless and comparatively rare plant. In fact, the great abundance of a weed or wild flower in one year, and its scarcity in another, is often due to its lacking one or more of these requisites. Weeds are the *homely* plants of a country, using the word in its true and original sense. A plant that is perfectly comfortable in its surroundings, if possessing considerable power of reproduction, becomes master of the situation, and is a *weed*.

The weeds of different countries must therefore differ because their conditions differ. For the same reason the weeds of different ages must also differ. Climate changes as geological time passes by, and all plants are not able to adapt themselves to these changes. It is frequently the case that a man placed in new circumstances is quite unable to adjust himself to them. His nature is not sufficiently plastic. So with plants. A wide range in time or space, with changing conditions, can only be enjoyed by a plant whose nature is plastic or capable of change. Place a weed of stiff or unyielding nature in less favorable conditions and it cannot adapt itself to them. It becomes unhealthy and lingers on, as it were, by sufferance among stronger neighbors—no longer a weed—or it speedily dies out. But a weed possessing a

plastic nature—one capable of being moulded by and to its new surroundings—ere long adapts itself, if the change is not too great or sudden, to its new situation, takes out a new lease of life, and continues in the strictest sense *a weed*.

Is it not possible that some such cause as this may lie underneath the facts we detailed in the earlier part of this paper? The true and full explanation of the transfer of European species to America should at the same time explain the absence of American species from Europe. But the partial causes already alluded to fail to do this. There is a residual effect for which they do not account. May it not be true that the plants of the European flora possess more of this plasticity, are less unyielding in their constitution, can adapt themselves more readily to their surroundings, and thus secure their continuance in the New World? And may it not be the lack of this plasticity in the American flora which incapacitates it for securing a foothold and obtaining a living in the different conditions of the Old World? Under the care of the gardener they grow and embellish the gardens and conservatories of Europe, but without this care they speedily fail and die.

To point out the physiological basis of this property of plasticity is at present and will probably long remain impossible. But that such a property exists in both the animal and vegetable kingdoms is beyond a question. It is the secret of that variation which so strongly marks some species, while its absence is the cause of that fixedness which characterizes others. It is the secret of that quick response which some plants make to a change of conditions, and whereby they gain fresh vitality at the cost, it may be, of some slight modification of structure. Its absence, on the contrary, causes that indifference or resistance which characterizes others, and which is almost always followed sooner or later by the extinction of the resisting species.

Though, however, the indication of the exact physiological basis of this plasticity of constitution is as yet beyond our reach, it seems possible to point out one fact which not improbably has had some share in reducing the plasticity of the American flora. To approach a single short step nearer to the object of our quest, when that object is at present unattainable, is so much ground gained. We are all familiar with the effects of habit upon ourselves. We all know how easy habitual actions become; how strong is the tendency to perform them when the conditions recur under which they are usually performed, and how unwillingly we deviate from our daily course after following it for years. To this one fact—the power of habit—is due the uncomfortable, unsettled state of most men who make some great change in their outward surroundings late in life. Few who emigrate in old age ever become quite reconciled to their new home. The habits of many years have so moulded them in body and mind, and set them so firmly in their mould, that the plasticity they may have once possessed is gone, as bricks dried and burnt have lost the pliancy they possessed when in the form of clay. Of the physiological cause of this fact we know nothing, but the fact no one can doubt. Experience shows us that habit is no less powerful in plants than in animals. What a plant has been in the habit of doing that it will incline to do again. The physical organization of the plant, acted upon by the conditions that surround it, produces its habit. The longer these remain unchanged the longer do its habits continue, and the longer its

habits continue the more firmly, we must infer, do they become ingrained in its physiological structure. Thus do habit and organization act and react on each other. Each may be changed, but all such changes are slow, and we may easily, in view of these facts, believe that after many years or ages of unchanged conditions a plant may become (as many an old man becomes) so firmly set in its habits, so rigid in its nature, as to resist modifying influences with all the energy it possesses, and rather die than change. This is what we mean by losing its plasticity. A plant accustomed in the climate of England to occupy two months in perfecting its seed may, if suddenly removed to another country, continue its former practice or it may not. In the former case, if the new climate does not afford the time required, the seed is not ripened and the species fails. If, however, the plant can adapt itself to the shorter season, and ripen its seed earlier, it may survive. But for this result a high degree of plasticity is needed. On the other hand, if the change of climate be made more slowly, the habits and organization of the plant may keep pace with it, and with even less plasticity than in the former case, the species may survive.

We may advance at least one step farther. If these views on the relation of habit and organization to time be correct, have we not a possible, though at present a rude, gauge for both? If the strength of habit increases with time, may we not roughly measure that strength by the length of time during which the habit has prevailed? And further, if the plasticity of plant nature diminishes and its rigidity increases with the duration of a habit, may not this duration in like manner be employed to some extent as a gauge of rigidity; that is of want of plasticity? We stand here on new and difficult ground, and any deduction must be tested severely before reliance can be placed upon it. The confines of geology and botany, the place where the two sciences march together, is almost unknown territory over which science is just beginning to extend its conquests. The tracing of earth's existing flowers into her past, the genealogy of plants, is a subject closely connected with that other subject—the descent of species—which now so sorely divides the leaders in natural science. Nevertheless, we propose in the concluding portion of this paper to grope out into this unknown land where the light is so dim, and try to feel our way along the clue indicated above, in the hope of finding some link that may connect the apparently inconsistent facts we are attempting to reconcile—the abundant westward migration of plants from Europe, and their scanty eastward migration from America.

Have we then, at the outset, any reason to believe that the North American flora possesses less plasticity than the European? Let us apply the gauge just mentioned and see the result—the gauge of time. We are in the habit of calling America the "New World." Botanically, and also, we may add, zoologically speaking, America is the older and Europe the younger. Europe passed ages ago through the stages of plant life which America exhibits to-day. The trees and plants of America, like most of her native animals, belong to old-fashioned, antiquated types—types that have passed away from European life and now lie entombed beneath its surface in the records of geology. If we turn for a moment and consult these buried registers of births and deaths, we find that in ages past the existing families of America were living in Europe. Name after name may be turned up, long struggle. Our country swarms with the weeds of Europe, while our own weeds shrink from the conflict both in Europe and at home.

unknown and long forgotten, where once it lived in the Eastern World, but faithfully recorded in these volumes, and yet surviving through American relatives in the West. The woods of Europe once contained trees identical with those now growing in the forests of North America. The miocene formations of Switzerland have yielded to the labor of Prof. Heer, of Zurich, a rich harvest of fossil plants amounting to at least 900 species. The descriptions and illustrations of these may be found in his great work on the "Tertiary Flora of Switzerland" (1855-'59). These tertiary beds lie in the great valley between the Jura Mountains and the Alps, and bear the name of the Molasse. From other parts of Europe also, and from high northern regions, similar fossil remains have been brought to light, and our knowledge of the European tertiary flora, though still very fragmentary, is in a condition to admit of fair comparison with the existing floras of the world.

Space will not allow a minute enumeration of examples; nor is it necessary for the purpose of establishing the assertion made above concerning the relationship of the living plants of America to the fossil tertiary plants of Europe. A few illustrations of the better known forms will suffice. Among the relics obtained from the beds at Oeningen are the leaves of a maple tree with flowers and seed. Europe possesses several maples, but these fossils resemble none of them, while they can scarcely be distinguished from the common red maple (*Acer rubrum*) of North America. Europe also possesses her Plane tree (*Platanus orientalis*), but the fossil plane of Oeningen is not identical with this. It much more closely resembles the Western Plane or Button-wood (*P. occidentalis*) of America. The Miocene Vine of Oeningen is of an American type, and very closely allied to the Muscadine or Southern Fox Grape of Maryland and Kentucky. A Fan Palm (*Sabal major*) has been found in the Swiss Miocene. It belongs to a genus now known only in America, and found in the Southern States. The genus *Taxodium*, to which belongs the beautiful Bald Cypress (*T. distichum*) of the Southern cedar swamps, was once represented in Europe by a species so like the American that its remains can be with difficulty distinguished. The Tulip Tree (*Liriodendron tulipiferum*) is the queen of the forest in the Middle States. In Europe it has passed away, but its remains are entombed in the Swiss Miocene. Another of these tertiary fossils—an elm-like tree—was at first only distinguished from the American Planer Tree (*Planera aquatica*) by Prof. Heer on account of the size of its fruit; but on seeing the specimens at Kew he admitted that no distinction could be drawn between them. The Giant Redwood (*Sequoia gigantea*) lingers in California, dependent upon the protection of man to save it from extinction. Though now replanted and flourishing in European shrubberies, it passed away from that continent ages before the woodman's axe or the more murderous forest fire had begun to destroy. Of somewhat more recent date, but yet fossil, is the European Sweet Gum Tree (*Liquidambar Europæum*), a species closely allied to the Sweet Gum of the Eastern and Middle States of America (*L. styraciflua*), but the genus is now totally unknown in Europe. Again, the Black Walnut of America (*Juglans nigra*) lies buried in the Miocene beds at Oeningen, and Europe has imported the far superior walnut from Persia to supply its place. The writer has been informed that the late Prof. Agassiz, on his arrival in this country, applied to a gentleman well known for his

study of the American forest trees, and asked for an introduction to the Hickory family of America, remarking that all the members with which he was acquainted in Europe were fossil in the tertiary beds of his native land. Lastly, no fewer than eight species of smilax, a genus scarcely known in Europe, but abundant in America, have been found in the Miocene of Switzerland.

We may here remark in passing, that anyone desiring to see for himself the close resemblance between the European fossils and their living American representatives can do so by paying a visit to the Agassiz Museum at Cambridge, where, in one of the upper galleries, may be seen a collection which has no equal or second on this side of the Atlantic.

It is just necessary here, in order to avoid leaving a flaw in the argument, to state that many of these species have been discovered in beds of equal or greater age in this country. It is therefore impossible to urge that they may have passed from Europe to America so lately that changes have not yet had time to develop themselves. On the contrary, some geologists are inclined to maintain that they existed in America before they appeared in Europe. At all events, we are warranted in asserting that during the Miocene age trees of the kinds named grew in Europe and America, as well as in Greenland and Spitzbergen and other points in the far North.

We do not propose here to investigate the causes of these changes. It is sufficient for our purpose to maintain the fact, that during tertiary geological times the European flora has changed, and largely changed, while the American flora has remained stationary, or nearly so. Plants which have changed in this interval thereby show an ability to change—a plasticity—which may be shown again should occasion arise. Plants which have not changed during the same interval show no proof of possessing the same plasticity. Moreover, if the principle is true that long existence without change strengthens the habits or increases the rigidity of the species, it is a necessary inference that the American flora, or so much of it as has existed during this long interval unchanged, must be less plastic than the present European flora, which has, during the same interval, been so largely modified. So many ages of persistence in type cannot well be without effect. Little as we yet know of geological time, we cannot estimate the age of the Swiss fossil plants at less than 500,000 years, and it may well be twice as much. This would place the European flora just as far later or newer in age and in development than the American—would give it the advantage of so many years of slow change—and may be supposed, in some degree, to have maintained or developed that plasticity to the possession of which we incline to attribute its ascendancy over the native American flora. On the other hand, the native American flora, living unchanged through all these 500,000 years, may well have lost some of the plasticity it perhaps once possessed, and have become comparatively rigid, so that it is to that extent unable to adapt itself suddenly to the changed condition of Europe at present. It cannot therefore compete with the more plastic and more highly-developed forms which it meets in the Eastern World; nor can it, in all cases, even hold its own against them on a soil and in a climate where it has dwelt for so many ages unmolested. The younger plant-life of Europe, like the white man, is more than a match for the old-fashioned life of this so-called New World of America, and the weaker fails in the

Summing up the argument, in conclusion, we have pointed out:

1. That many of the weeds of Europe have migrated to America.
2. That many of these have become so thoroughly naturalized here that they prevail over some of the plants native to the soil.
3. That only two or three American weeds have crossed the Atlantic and become naturalized in England.
4. That the difference of climate and the conditions of mutual commerce do not fully account for this marked difference in the migrative power of the two floras.
5. That in the Miocene era the European and American floras were very much alike.
6. That since that era the European flora has been vastly altered, while the American flora still retains a Miocene aspect, and is therefore the older of the two.
7. That this long persistence of type in the American flora may have induced, by habit, a rigidity or indisposition to change in the American flora.
8. That the changes in the European flora since the Miocene era betray a plasticity of nature, or power of adapting itself to circumstances of which the American flora gives no sign.
9. That in this view the European flora is better able to adapt itself to the strange climate and conditions—that is, to emigrate—than the American flora.
10. That being thus more plastic or adaptable it succeeds in the New World, while the less adaptable American flora fails in the Old World.

The writer wishes to add that in the above paper he has brought forward chiefly the instances of migration from England to America and *vice versa*. A few other American plants might be found naturalized in other parts of Europe on closer examination, but the list, at best, would be exceedingly scanty.¹—*Pharm. Journ. and Trans.*, Nov. 22, 1879.

VARIETIES.

Fucus Vesiculosus (Anti-Fat).—Now that this remedy is so universally used for the reduction of obesity, it may interest the profession to recall to mind another use found for it in 1826.

Laennec having observed that on the coast of Brittany, where the air is more humid, but at the same time milder and more equable than in the interior of France, the number of phthisical patients was comparatively small, and having also seen that young men from Brittany became consumptive during their sojourn in large cities, and recovered on returning to their native province, came to the conclusion, that the peculiar atmosphere of the sea coast had something to do in these results.

He, therefore, tried to imitate it, in some measure, by placing near the beds of the patients certain fresh marine plants. He brought together, into two small wards, a number of phthisical patients, and surrounded their beds with the *fucus vesiculosus*,

¹ *Rudbeckia laciniata* has established itself in many parts of Central Europe.—See "Amer. Jour. Pharm.," 1872, p. 107—Editor.

causing them to drink also an infusion of the same plant. None appeared to suffer from this mode of treatment, as long as the fresh *fucus* could be procured.

The cough became less frequent, the breathing less confined, the expectoration less in quantity. In the greater number the hectic fever ceased, and the progress of emaciation was arrested.

In 1826 the *fucus* caused fattening and arrest of emaciation; now it produces emaciation, or rather it reduces bulk, according to testimony of many writers, who perhaps do not take into account the diet they adopt, or the hygiene they follow, as being a more important factor in the matter.

We do not hear now of *fucus* in consumption. In fifty-three years' time shall we hear of Anti-Fat?—*Med. Press and Circ.*, Dublin.

Helianthus annuus.—An infusion of the stem of the sunflower has been successfully used as a remedy for intermittent fever for three years by P. Filatow. The fresh or dried stems are cut into small pieces and macerated with 8 parts of whisky for three or four days. This tincture is administered in the dose of a tablespoonful three times daily for adults. The author claims to have derived almost fully as satisfactory results from the use of this exceedingly cheap preparation as from the very expensive quinia.—*Pharm. Ztschr. f. Russl.*, 1879, p. 624, from *St. P. Med. Wochenschr.*

Preparations of Thymol.—Thymol answers admirably well for antiseptic washes in the proportion of 1 part to 20 parts of glycerin and 100 parts water; the mixture does not injure surgical instruments, and is an excellent substitute for carbolic acid, being more efficacious without possessing such an unpleasant odor.

Thymol glycerole consists of 1 part thymol and 100 parts starch glycerole.

Thymol lotion is a solution of 1 part thymol in 4 parts of alcohol

Thymol salve consists of from 1 to 4 parts of thymol and 100 parts of lard.

—*Pharm. Centralh.*, 1879, p. 428, from *Ztsch. d. Allg., Oest. Ap. Ver.*

Transparent glycerin soap is made by melting together 500 grams of tallow, 500 Ceylon cocoa oil, 250 castor oil, 50 palm oil and 500 glycerin, and, when the mixture reaches 70 to 75°C., adding gradually 650 of soda lye (spec. grav. 1.385), stirring constantly; as soon as saponification is completed, which is usually the case at the expiration of a few minutes, the mass is removed from the fire, 600 grams of 96 per cent. alcohol are added, and the mixture is stirred until it is clear and until it will congeal on a spatula, when a solution of 100 grams of sugar in 50 of water is added, the mixture is perfumed and poured into moulds.—*Pharm. Ztg.*, 1879, p. 719

Removal of Silver-Nitrate Stains.—Instead of potassium cyanide, Dr. H. Kaetzer uses a solution of 10 grams ammonium chloride and 10 grams corrosive sublimate in 100 grams distilled water, which must be kept in glass-stoppered bottles. It will readily remove the stains from the skin, linen, wool and cotton, without injuring the fabric.—*Pharm. Ztg.*, Dec. 10, 1879, p. 767, fr. *Neueste Erf. u. Erfahr.*

New Cement for Filling Teeth.—It consists of the pyrophosphates of calcium and barium, with that of zinc or magnesium, and is made by Rostagni by fusing together in a crucible calcium phosphate and zinc phosphate, pouring out the mass, powdering, dissolving in dilute phosphoric acid and evaporating to a syrupy consistence. The liquid is mixed with a powder prepared by triturating 3 kilograms zinc oxide with from 5 to 50 grams boracic acid and a little water; the mass is dried, heated to redness for a few hours, and, after cooling, is powdered. For use the powder is formed into a paste with water.—*Pharm. Ztschr. f. Russl.*, Nov. 13, 1879, p. 693, fr. *Dingl. Journ.*

A white tooth powder, which turns red when moistened, is made by reducing to a fine powder cochineal, 15 grains, and alum, $\frac{1}{2}$ drachm, and mixing with powdered orris root, 1 ounce; cream of tartar, 10 drachms; carbonate of magnesium, $1\frac{1}{4}$ drachm; powdered cuttle-fish bone, 5 drachms, and oil of rose, 5 drops.—*Pharm. Ztschr. f. Russl.*, from *Ztschr. d. Oest. Ap. Ver.*

Anilin Inks.—Dr. Siemens publishes the formulæ:

Red.—Dissolve 1 part diamond fuchsin, soluble in water, in 150 or 200 parts hot water.

Blue.—1 part "bleu de nuit" (bleu de Paris) to 200 or 250 parts hot water.

Violet.—1 part blueish-violet anilin in 200 parts water.

Green.—Dissolve 1 part iodine green in 100 or 110 parts hot water; it writes bluish-green. If a yellowish-green lustre is desired, a little picric acid is added.

Yellow.—(Anilin is not advisable.) 1 part picric acid in 120 or 140 parts water.

Black.—1 part nigrosin, soluble in water, is dissolved in 80 parts water.

These anilin inks are very bright, never precipitate the coloring matter, flow readily, dry quickly, do not mould, and can be readily liquefied again when dried up. They should not be made too concentrated, should not be used with a new pen, and require dilution with water in case the writing has a coppery lustre. If an addition of gum is desired, which is generally not necessary, 1 part dextrin may be added to 100 parts of ink, but never gum arabic.—*Pharm. Ztg.*, Dec. 3, 1879.

SIXTH DECENNIAL PHARMACOPŒIA CONVENTION.

By virtue of authority devolved upon me as the last surviving officer of the Pharmacopœia Convention of 1870, I again call the attention of "the several incorporated State medical societies, the incorporated medical colleges, the incorporated colleges of physicians and surgeons and the incorporated colleges of pharmacy throughout the United States," to the importance of appointing delegates to the sixth decennial pharmacopœia convention, and of sending the names and residences of the same to me for publication. The convention meets on the first Wednesday in May, 1880, and I am required "to publish the names and residences of the delegates, for the information of the medical public, previous to its meeting."

I have received so far the names and residences of the following delegates :

From the Massachusetts College of Pharmacy, Boston : Prof. G. F. H. Markoe, Ph.G. ; Samuel A. D. Sheppard, Ph.G. ; Thomas Doliber, Ph.G.

From the Philadelphia College of Pharmacy : Prof. John M. Maisch, Alfred B. Taylor, Prof. Jos. P. Remington.

From the Louisville College of Pharmacy : Prof. Emil Scheffer, Prof. C. Lewis Diehl, E. Vincent Davis.

From the Maryland College of Pharmacy, Baltimore, Md. : *Delegates*—Wm. S. Thompson, Louis Dohme, Jos. Roberts. *Alternates*—Charles Caspari, Jr, Dr. John F. Moore, Dr. Robert Lautenbach.

From the Medical Society of the District of Columbia : Prof. D. W. Prentiss, M.D. ; Prof. Thomas Antisell, M.D. ; Emeritus Prof. James E. Morgan, M.D.

From the National Medical College of Columbia University, Washington, D. C. : Prof. W. W. Johnston, M.D. ; Prof. D. W. Prentiss, M.D.

From the Medical Department of the University of Georgetown, D. C. : Prof. W. H. Ross, M.D. ; Prof. C. H. A. Kleinschmidt, M.D.

From the National College of Pharmacy, Washington, D. C. : Mr. W. S. Thompson, Prof. Oscar Oldberg, Mr. R. B. Ferguson.

(Signed,)

JAMES E. MORGAN, M.D.,

905 E Street, N. W., Washington, D. C.

Washington, D. C., January 28, 1880.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, January 20th, 1879.

The meeting was called to order by the President, Dillwyn Parrish ; the minutes of the last meeting were read and approved.

The Registrar presented five bound volumes of the "American Journal of Pharmacy," on behalf of our fellow member Mr. S. S. Bunting, and three volumes of the "New York Journal of Pharmacy," published in the years 1851-52-53, were also donated to the library by the Registrar. In this connection the Registrar requested those members having any of the older volumes of our "Journal" which they were willing to donate to the library to inform him, so that he could send for them, as we now only required eight volumes to complete the entire series.

Mr. Robert Shoemaker read a paper entitled *the apprentice of fifty years ago* (see page 65). The reading elicited remarks from several present, citing instances of similar character to those noted by the writer. Mr. Thompson said that the paper gave the younger portion of our trade a clear apprehension of the great advantages they possess over the learners of olden times. On motion the paper was referred to the Publishing Committee.

A paper upon *the oxidation of iron by nitric acid* (see page 74) was read by Mr. F. L. Slocum, a member of the present class. The paper was well received and referred to the Publishing Committee.

Professor Sadtler exhibited specimens of ozokerite from Austria, both crude and bleached, also of paraffin residuums that were obtained in the refining of petroleum. He suggested that these residuums should be used in the preparation of a basis for ointments, similar to cosmoline and vaselin.

Prof. Maisch read a paper by Mr. L. Lyons, a member of the present class, upon bromide of zinc and the syrup of that salt (see page 75). This paper was accompanied with specimens of the products obtained, and of mixtures of the syrup with various tinctures, medicated waters and syrups. The paper was referred to the Publishing Committee.

Mr. E. T. Ellis exhibited specimens of spherical soluble gelatin-coated pills, the coating of which was perfectly transparent.

A. paper by Mr. J. U. Lloyd, of Cincinnati, upon the coloring matter of *Fraseria Walteri* or American Colombo (see page 71) was read by Prof. Maisch, who remarked that he believed the crystals obtained by Mr. Lloyd to be identical with gentisin or, as it is also called, gentisic acid. This paper was also referred to the Publishing Committee.

Prof. Maisch read a paper upon some American species of *Artemisia* (see page 69), and presented for the Cabinet a specimen of *Artemisia dracunculoides*, from Arkansas. This paper was referred to the Publishing Committee.

An inquiry for a formula for compound tincture of ipecacuanha, or fluid Dover's powder, was answered by the following formula, taken from Dr. Squibb's list of preparations:

"COMPOUND TINCTURE OF IPECACUANHA, OR A FLUID FORM OF 'DOVER'S POWDER.'—Some years ago it was suggested that a mixture of Compound Solution of Opium, or of Deodorized Tincture of Opium, with Fluid Extract of Ipecacuanha, in proper officinal proportions, would form a good and convenient substitute for the Compound Powder of Ipecacuanha or Dover's Powder. It is prepared by concentrating the Deodorized Tincture of Opium on a water-bath, replacing the proportion of Alcohol lost, and mixing with this the Fluid Extract of Ipecacuanha in such proportion that each ten minims of the mixture represents one grain of Opium and one grain of Ipecacuanha; or, so that the mixture represents Dover's Powder in the proportion of minim for grain."

An inquiry for a formula for an elixir of lacto-peptin was made, and a specimen of it, with the formula by which it may be prepared, was promised by Dr. Mattison.

On motion, the meeting adjourned.

T. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Alumni Association, Philadelphia College of Pharmacy.—The fourth social meeting of the session was held January 8, Mr. L. E. Sayre in the chair and Dr. Mattison acting as secretary. The pulverization of camphor by means of sublima-

tion was discussed; some remarks were made on description of drugs, and the nature of homœopathic preparations and medicines was alluded to. A preparation for *disguising the taste of quinia*, made by Mr. Pennypacker, was exhibited. It consists of equal parts of fluid extract of taraxacum, fluid extract of liquorice-root, and simple elixir.

Boston Druggists' Association.—At the annual meeting, held January 27, the following officers were elected: President, Joseph Burnett; Vice Presidents—A. Sigourney Bird, Thomas Doliber; Secretary, Henry Canning; Treasurer, Charles C. Goodwin. Executive Committee—E. Waldo Cutler, G. F. H. Markoe, J. S. Melvin, E. H. Doolittle, J. S. Orne, I. B. Patten, A. G. Weeks. Committee on Membership—Solomon Carter, D. G. Wilkins, R. R. Kent, A. R. Bayley, B. O. Wilson.

The preparation of a pharmacy law and its presentation to the legislature for adoption was discussed at some length, and then referred to the Executive Committee.

At 5 o'clock the members and invited guests sat down to their fifth annual dinner, and after justice was done to the *menu* provided by Parker's, speeches were made by many of those present.

Pharmaceutical Association of Iowa.—A call, signed by a large number of pharmacists and druggists of Iowa, has been issued by Messrs. Geo. H. Schafer & Co., of Fort Madison. The convention will meet in the Academy of Music in the city of Des Moines, February 10 and 11, with the view of organizing a State Pharmaceutical Association. A bill for the regulation of the practice of pharmacy has been introduced into the House of Representatives, and it is expected that after the same shall have been discussed by the convention it will be passed by the legislature. We wish the proposed Association good success.

EDITORIAL DEPARTMENT.

“The Relation of Drug Manufacturers to the Progress of Therapeutics” is the title of a lengthy paper which was read before a medical society in Boston, by Dr. Robert T. Edes, professor of materia medica in Harvard University, and published in the “Boston Medical and Surgical Journal” of January 15th. The paper seems to be aimed on the one hand against the introduction of new remedies without careful chemical and physiological study, and on the other hand against the multiplication of compound medicines, frequently containing ingredients which no intelligent physician would prescribe together, or which may suit a particular case without being adapted to general application. Dr. Edes says: “When the pharmacist informs us of active principles, or gives us preparations honestly representing a drug, he does good service, but when he tells us why they act or when they should

be used he is going beyond his province." This is quite correct; but we wish to remind Dr. Edes that the aim and the practice of the various pharmaceutical colleges and associations is, in part, exactly that which he points out in the first part of the sentence quoted, while the condition depicted in the latter half has been brought about, not by the hoodwinking of the pharmaceutical profession, but through the easy-going credulity of the medical profession and press. Medical journals frequently extol preparations of the composition and mode of manufacture of which neither the writers of such articles nor the editors of the journals can have the remotest idea. The dispensing pharmacist is compelled to procure what the physician orders, even though, as Dr. Bolles stated before the society, he may have three or four good manufactures of extract of malt on his shelves, and be obliged to get a fifth kind, "because it is put up in such pretty bottles."

The physician creates the demand, and, in very many cases, the pharmacist cannot supply it, but has to fall back upon the manufacturers. Of course it is to the latter's interest—and this is perfectly legitimate—to respond to the demand, and, if possible, to increase it. We do not blame them, as long as they can find credulous doctors to prescribe their inventions, to get up new ones whenever a bright idea, with the probability of money in it, dawns upon them; but we do not regard this as legitimate pharmacy, even though such preparations be endorsed or prescribed by professors in medical colleges.

Dr. Bolles was correct in stating that physicians were more to be censured in this matter than the manufacturers or their agents—and most decidedly more than the pharmacist, who has to gratify such whims, not unfrequently to his loss. Let the physician confine himself as much as possible to pharmacopœial preparations, and let him, as Dr. Bolles suggested, "hold the pharmacist personally responsible for the quality of their medicines, not directing them to get this or that manufacturer's ordinary preparations, nor allowing them to shield themselves behind the names of any wholesale makers, however famous." Not until then will the evil of which Dr. Edes complains be eradicated.

There are other points in Dr. Edes' paper to which fairly objection may be taken. We do not believe that, after due consideration, he would reiterate that morphia and atropia were all that is essential in thirty-two official preparations. And in regard to recognition by the pharmacopœia, we believe that his own admission, with regard to iron preparations, will reconcile him with the coming pharmacopœia, the scope of which will probably be extended rather than abridged.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Pharmacographia—A history of the principal drugs of vegetable origin met with in Great Britain and British India. By Friedrich A. Flückiger, Phil. Dr., Professor in the University of Strassburg, and Daniel Hanbury, F.R.S., Fellow of the Linnean and Chemical Societies of London. Second edition. London. Mac-Millan & Co. (22 Bond street, New York), 1879. 8vo., pp. 803. Price, \$5.

We take great pleasure in calling the attention of our readers to the appearance

of the second edition of this work, which contains such a mine of information on the drugs used in Great Britain and in India. In scope and arrangement the work is identical with the first edition, which was described in this journal, 1874, p. 589. In the present edition jaborandi leaves (*Folia pilocarpi*) are introduced, and a separate article is devoted to *gallæ chinenses seu japonicæ*, which formerly were treated under *gallæ halepenses*. Numerous botanical synonyms are given and many additions have been made, more particularly to the historical and chemical notes relating to the different drugs, so as to bring the information up to our present knowledge. A very acceptable addition is found in the appendix, which contains short biographic and bibliographic notes, relating to (ancient) authors and books quoted in the body of the work. As a source for trustworthy information, on the most important drugs, Pharmacographia will always be of the highest value, and no library on materia medica can be considered complete without it. It is proper to state that, though deprived of the assistance of Daniel Hanbury through his death nearly five years ago, Professor Flückiger has secured much valuable information from gentlemen named in the preface.

The Yearbook of Pharmacy: Comprising Abstracts of Papers relating to Pharmacy, Materia Medica and Chemistry, contributed to British and foreign journals from July 1, 1878, to June 30, 1879; with the Transactions of the British Pharmaceutical Conference at the sixteenth annual meeting, held at Sheffield, August, 1879. London: J. & A. Churchill, 1879. 8vo, pp. 567.

This annual publication reports with accustomed accuracy on the investigations of interest to pharmacists published during the period indicated. Nearly one-half of the book contains the transactions, list of members, etc., of the British Pharmaceutical Conference. In our October number we have published an account of the last meeting, at which twenty-one papers were read, and of these several have been transferred to our columns.

Jahresbericht über die Fortschritte der Pharmacognosie, Pharmacie und Toxicologie. Von Prof. Dr. G. Dragendorff. Neue Folge. 13. Jahrgang, 1878. Göttingen: Vandenhoeck & Ruprecht's Verlag. 1879. 8vo, pp. 656.

Annual Report on the Progress of Pharmacognosy, Pharmacy and Toxicology for the Year 1878

This publication is replete with information. Like the preceding volumes, it is a full record of the investigations and observations in pharmacy and the collateral sciences, which have been published during the year 1878. As heretofore, it contains also a list of new publications (376), in different languages.

It will be of interest to many of our readers that the publishers have reduced the price of the first ten volumes of the present series to 45 marks, which is less than one-half the publishing price.

Proceedings of the Ninth Annual Meeting of the New Jersey Pharmaceutical Association. Camden, 1879. 8vo, pp. 64.

A report of the meeting, which was held at Princeton, May 21 and 22, will be found in our July number. The pamphlet contains, in addition to the minutes, the papers read, and an interesting and instructive report on pharmaceutical legislation in New Jersey.

Proceedings of the Ohio State Pharmaceutical Association at its first meeting, held in Columbus, September 2d, 1879. Cleveland, 1879. 8vo, pp. 16.

An account of the organization of this society will be found in our October number.

Proceedings of the Western Wholesale Drug Association, in convention at Milwaukee, Nov. 13th and 14th, 1879. St. Paul: John J. Lemon. 8vo, pp. 48.

The objects of the association are to create a permanent social feeling between the wholesale druggists, to obliterate the feeling of jealousy and distrust that seems to exist, to correct excessive and unmercantile competition, to remove by concert of action all evils and customs against good policy and sound business principles, and to establish rules and regulations, that all differences and grievances may be fairly and equitably adjusted.

The officers for the current year are: President, Dr. H. H. Button, Milwaukee. Vice-Presidents—J. C. Richardson, St. Louis; W. A. Robinson, Louisville; S. A. Tolman, Chicago; Geo. A. Kelly, Pittsburgh. Treasurer, S. M. Strong, Cleveland. Secretary, D. R. Noyes, St. Paul.

The Chemists' and Druggists' Diary. 1880. London. 4to.

This issue is accompanied by a map of the city of London.

The Physician's Hand-book for 1880. By William Elmer, M.D., and Albert D. Elmer, M.D. New York: W. A. Townsend, Publisher. 16mo, pp. 314. Price, \$1.75.

The first 134 pages are printed matter, giving brief information on diseases, poisons, properties of remedies, etc.; the remaining portion is prepared so as to be conveniently used by the physician for recording his professional engagements, for which purpose it appears to be well adapted. It is suitably bound in morocco with tucks, and may be conveniently carried in the pocket.

Ueber die Wirkung einiger Antiseptica und verwandter Stoffe auf Hefe. Inaugural-Dissertation von Woldemar Werncke, Dorpat, 1879. 8vo, pp. 99.

On the action of certain antiseptics and allied bodies upon yeast.

A large number of experiments were made with a liquid containing 1 gram of compressed yeast (dry residue = .246 gram) in 10 cc. of water, and its efficacy was proven to be fully equal to fresh surface yeast with an equal weight of dry residue. It was found that the following compounds completely destroyed the efficacy of the yeast liquid when used in the proportions indicated. Corrosive sublimate 1 : 42·800,

volatile oil of mustard 1 : 6300, thymol 1 : 3100, sodium hydrate 1 : 1050, salicylic acid 1 : 1000, oil of cinnamon 1 : 1000, xylol 1 : 800, benzoic acid 1 : 680, creasot 1 : 500, cresylic acid 1 : 460, crystallized carbolic acid 1 : 150, sulphuric acid 1 : 55, borax 1 : 50, glycerin 1 : 5. Altogether 47 different substances were experimented with, of which the least effectual, commencing with the weakest, were: saltpetre, zinc sulphate, potassium chlorate, boric acid, petroleum, sodium benzoate, quinia hydrochlorate, sodium salicylate and tannin.

The reception of the following reprints and reports is acknowledged:

Sketch of Heinrich Wilhelm Dove. By Frederick Hoffmann. With portrait. From the "Popular Science Monthly," December, 1879.

Réduction du Chlorure d'Argent (Reduction of Chloride of Silver). By Dr. D. Tommasi. From "Journ. de Phar. et de Chimie."

Recherches sur la Constitution des Hydrates Ferriques (Researches on the Constitution of the Ferric Hydrates). By Dr. D. Tommasi. From "Revue hebdom. des Sciences."

Notes on Hospital and Private Practice. By Henry Gibbons, Sr., M.D. Read before the California State Medical Society.

Some Important Topical Remedies and their use in the Treatment of Skin Diseases. By John V. Shoemaker, A.M., M.D. Read before the Medical Society of the State of Pennsylvania.

Neurasthenia (Nerve-exhaustion) with Remarks on Treatment. By Geo. M. Beard, A.M., M.D. From "St. Louis Med. and Surg. Jour."

Morbid Fear as a Symptom of Nervous Disease. By G. M. Beard, M.D. Read before the American Neurological Association.

Oesophagismus, with Remarks on the Subject. By J. J. Henna, M.D. From the "Hospital Gazette," Oct. 18, 1879.

Proceedings of the Association of Medical Officers of American Institutions for Idiotic and Feeble-minded Persons. Philadelphia: J. B. Lippincott & Co. 8vo, pp. 108.

This pamphlet contains the proceedings of the meetings held at Syracuse, N. Y., June, 1878, and at Lincoln, Ill., May, 1879.

Report of the Committee on Public Health Relative to Lunatic Asylums. Albany: C. Van Benthuysen & Sons. 8vo, pp. 51.

Presented to the legislature of the State of New York.

OBITUARY.

CHARLES HOWARD DINGEE was one of three graduates of the Philadelphia College of Pharmacy of the class of 1826—the first upon whom the diploma of the College was conferred. His associate graduates were Charles McCormick and William Sharp.

Mr. Dingee was born in the city of Philadelphia, May 22d, 1805. His early education was at a Friends' school on Pine street, near Second street. He after-

wards went to the school of Dr. Wiley, at Eleventh and Market streets, then known as the Latin school. At this school he received honors for proficiency in his studies.

After leaving this school he entered the store of Daniel B. Smith, as an apprentice to the drug and apothecary business. After graduating at the Philadelphia College of Pharmacy he entered into business with his brother, John Henry Dingee (also a graduate of this College), on Second street, near South street. On account of the impaired health of Mr. John H. Dingee, the partnership was dissolved, and Charles went into the employ of Nicholas Lennig, where he remained until he again formed a partnership with his brother, and opened a store at No. 145 South Front street, under the firm name of Dingee & Brother, for the purpose of conducting a drug commission business. After some years the partnership was again dissolved, and the business conducted by C. H. Dingee, retaining the old name of Dingee & Brother. The failure of his sight obliged him to withdraw from active business pursuits; he, however, retained a room in the building where his business had been conducted, and here he spent much of his time.

The father of Mr. Dingee died when Charles was about two years old, and his early care devolved upon his mother and his uncle, John Henry Fenner. From these worthy guardians he received the careful religious training which made him in after life a man of integrity, respected by all his business associates and friends.

He married early in life, but never had any children. He survived his wife several years.

Mr. Dingee died from paralysis at the house of his nephew, 1006 Clinton street, on the 30th of December, 1879, in the 75th year of his age. His funeral was attended by the officers of the Philadelphia College of Pharmacy.

J. B. ALPHONSE CHEVALLIER, honorary professor of the superior school of pharmacy at Paris, died there November 30, in the 87th year of his age. The deceased was for many years professor at the Paris school of pharmacy and a member of the Academy of Medicine and of the Board of Health. He was the author of numerous essays on pharmaceutical subjects, of which many will be found in the earlier volumes of this journal. In connection with A. Richard he published a dictionary of drugs, and, together with A. Payen, a work on chemical analysis. His most important work is a dictionary of falsifications of alimentary and medicinal substances. The deceased was, among others, an honorary member of the American Pharmaceutical Association and of the Philadelphia College of Pharmacy.

J. M. BOUTRON-CHARLARD, formerly a prominent pharmacist of Paris, died recently in that city at the age of 83 years. He retired from active business in 1834, but continued his scientific researches, many of which were made conjointly with Robiquet, Pelouze, Frémy and others. He was a member of the Academy of Medicine since 1824, was president of the Pharmaceutical Society of Paris in 1843, and since 1835 was one of the editors of the "*Journal de Pharmacie et de Chimie*," in which most of his scientific investigations were published. Several of his essays have been republished in the earlier volumes of this journal.

THE AMERICAN JOURNAL OF PHARMACY.

MARCH, 1880.

NOTE ON THE FRUIT OF ADANSONIA DIGITATA.

By F. L. SLOCUM.

Read at the Pharmaceutical Meeting February 17.

A short notice of the so-called "cream of tartar fruit" is contained in the "Amer. Jour. Pharm.," 1877, p. 254, and it is there stated to be probably distinct from the fruit of the *baobab*, *Adansonia digitata*. Opportunity was afforded by Prof. Maisch to examine some of the pulp covering the seeds of the latter. When examined under the microscope, the dry pulp is seen to be destitute of crystalline structure. It readily falls to a yellowish-white powder, and has a pleasant acidulous taste. The pulp of the cream of tartar fruit is of a darker color and more acid taste. The pulp is soluble in hot or cold water, and the solution has an acid reaction.

Examined for bases, potassium was found, and probably traces of calcium and phosphates, the two latter requiring confirmation, which, for want of time, had to be postponed for the present.

The examination for acids resulted in proving the presence of *malic acid* only, combined as an acid *malate of potassium*.

The aqueous solution, agitated with six volumes of strong alcohol, gives a copious precipitate of *pectin*, which forms the largest part of the pulp. The pectin, when dissolved in strong hot hydrochloric acid, yields a bright Magenta-colored solution.

Distilling the aqueous solution with water, ether and alcohol, gave no volatile compounds.

The concentrated aqueous solution left in the still had, in each case, a dark brown color, and deposited a white amorphous powder. On agitating this residue with ether, it was dissolved; on evaporation of the ether, it either separates as white, silky needles, or as a white amorphous mass.

After the removal of pectin and after the evaporation of the alcohol, the remaining solution yields, with alkaline solution of copper,

a very copious precipitate of cuprous oxide, showing a large percentage of *grape sugar*. No traces of *tartaric acid* were found.

Summing up the constituents, we have pectin, grape sugar, malic acid and potassium as acid potassium malate, a crystalline principle not further investigated, and probably traces of calcium and of phosphates.

EXTRACTUM GLYCYRRHIZÆ LIQUIDUM.

Editor of the American Journal of Pharmacy:

I take this opportunity to bring before you the following method of preparing the German *succus liquiritiæ depuratus*, often perscribed in this country. I call it *liquid extract* to distinguish it from the fluid extract of the root. The process is as follows:

Placing alternate layers of the commercial extract of licorice, in unbroken sticks, and clean straw into a sufficiently large percolator, I proceed to exhaust the licorice with water, to which a small quantity of ammonia water is added—about 4 ozs. to the gallon. You will at once see the object in using ammonia. It combines with the glycyrrhizin, which becomes freely soluble, and is therefore more readily exhausted from the extract; and as the percolate will have to be concentrated by evaporation, there will be no danger of having free ammonia in the product. I prepare it of such a strength that each pint represents 1 lb. of the solid extract.

Whenever the powdered extract is to be dispensed in solution I use this liquid extract, which imparts a much better appearance than the powder, and has just as much, if not more, of the sweet principle of licorice; at the same time, the preparation is free from the large amount of inert matter contained in the commercial extract of licorice.

I also obtained an excellent aromatic syrup of licorice from the formula published in the "*Amer. Jour. Pharm.*," 1877, page 578, by substituting this liquid extract for the powdered extract. I proceed exactly the same way as does the writer, only making this substitution. It is true that nearly all the aromatic properties of the drugs are lost by this process, but still enough are retained to give the syrup a very pleasant aroma. I have introduced this to physicians whenever I could, and always received their full approbation that it is a most excellent vehicle for quinia preparations.

Yours, etc.,

WM. MITTELBACH.

St. Louis, Mo., January 30, 1880.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

The unpleasant and offensive Odor of Iodoform is easily overcome by E. Biermann by the addition of from 5 to 8 drops of volatile oil of fennel to 1 gram of iodoform. Its efficacy is really surprising, and far exceeds that of oil of peppermint (see "Amer. Jour. Pharm.," April, 1879, p. 190) and of balsam of Peru.—*Pharm. Ztg.*, Jan. 10, 1880, p. 16.

The Odor of Musk is rendered less penetrating, according to E. Biermann, by the addition of powdered fennel-seed (for other methods see "Amer. Jour. Pharm.," 1879, p. 25 and 487).—*Ibid.*

Salicylic Acid Tampons.—As employed in the German army, they consist of pieces of soft gauze of about 13 or 16 square centimeters, which are loosely tied around 1 or 2 grams of cotton, so as to be readily formed into any desired shape by pressure. One kilo of these tampons is impregnated with a solution of 110 grams of salicylic acid and 40 grams of castor oil in $3\frac{1}{2}$ or 4 liters of 95 per cent. alcohol. They are afterwards dried in a well-ventilated room, and are intended to be used in applying a temporary bandage until the services of a surgeon may be procured. Bernbeck suggests the use of glycerin in place of the castor oil, considering it far preferable.—*Ibid.*, 1879, p. 704.

Compound Solution of Carbolic Acid.—Hager recommends the following:

Take of	Sumatra benzoin (2d quality),	.	.	.	100°0
	Aloes,	.	.	.	50°0
	Crude salicylic acid,	.	.	.	25°0
Reduce to powder, and add					
	Oil of spike,	.	.	.	50°0
	Oil of star anise,	.	.	.	10°0
	Alcohol,	.	.	.	1000°0
Macerate for 1 day, shaking occasionally, then add:					
	Oleic acid,	.	.	.	100°0
And a previously prepared solution of					
	Crude caustic soda,	.	.	.	60°0
	Borax,	.	.	.	25°0
	Water,	.	.	.	500°0
Digest, shaking occasionally, for 1 day, and add to the warm mixture					
	Crude carbolic acid (containing 90 to 95 per cent. phenol),	.	.	.	3000°0

Shake for half hour, then set aside in a cold place for a week, and decant the liquid.

The solution must be used cautiously, so as not to come into contact with the eyes, lips and other tender portions of the body. For killing vermin on animals it is applied with a brush, previously diluted with 100 or 120 parts of water, and with linen or cotton, also for disinfecting offensive sores. When used for protecting horses, etc., against flies and other insects, very little of the composition is applied with a brush once or twice a day.—*Phar. Centralb.*, Jan. 15, 1880, p. 27.

Fennel-honey consists of purified honey, 500 grams; malt-sugar, 1,000 grams; fennel oil, 5 drops, and a little glycerin.—*Pharm. Ztg.*, 1879, p. 719.

Clarified Honey.—Frank Juehling objects to the use of tannin, because honey thus purified always contains traces of tannic acid, which will react with iron, quinia and other salts. He prefers the following method: Six kilograms of honey are dissolved in 3 kilograms of water on a water-bath. About one sheet of filtering-paper, previously triturated into a pulp with water, and freshly-precipitated and washed aluminium hydrate are added, until a filtered sample, transferred to a test tube, appears perfectly bright. After cooling, the liquid is passed through a linen or cotton strainer and evaporated to the weight of 6 kilograms. The quantity of aluminium hydrate precipitated from 500 grams of alum and 600 grams of soda is more than sufficient.—*Ibid.*, 1879, p. 704.

Extemporaneous Preparation of Syrup of Licorice.—Juehling prepares a syrup, equal in strength to that of the German Pharmacopœia, by mixing:

R	Essentiæ liquiritiæ,	.	.	.	.	.	10°0	
	Syrupi simplicis,	.	.	.	.	.	180°0	
	Mellis depurati,	.	.	.	.	.	120°0	M.

Essentia liquiritiæ is made by extracting twice 1,000 grams of licorice root with 3,000 grams of water, evaporating the infusion to 500 grams, adding 500 grams of alcohol, filtering and evaporating to 333 grams (consistence of honey).—*Ibid.*

The solubility of Ozone in water has hitherto been a disputed question. A. R. Leeds conducted ozone into two bell-glasses containing water, which covered lead sulphide in one and silver in the other glass. Sufficient ozone was absorbed by the water to cause oxidation of the silver and of the lead sulphide, in the latter case apparently with the production of brown anhydrous lead peroxide and of free sulphuric acid.—*Ber. d. Deutsch. Chem. Ges.*, 1879, p. 1831.

Karlsbad-Sprudel Salt (see also "Amer. Jour. Phar.," 1878, p. 474, and 1879, p. 454). Dr. Harnack states that

The genuine anhydrous salt contains sodium sulphate, 99.33 per cent; sodium carbonate, 0.45 per cent., and sodium chloride, 0.076 per cent., and, therefore, is nearly pure Glauber's salt, from which it differs chiefly in being 30 times more expensive.

The artificial salt contains much more soda, is made usually by allowing a solution of 200 parts of crystallized sodium sulphate, 30 parts of crystallized sodium carbonate and 5 parts of sodium chloride to crystallize, is not uniform, and, therefore, objectionable, for which reason the author suggests the adoption of an officinal formula directing a mixture of the powdered salts.—*Pharm. Ztg.*, Jan. 21, 1880, p. 38, from *Klin. Wochenschr.*

Ferric Hydrates.—The trihydrate, $\text{Fe}_2(\text{OH})_6$, has never been prepared thus far according to Tommasi, who mentions the existence of two isomeric, respectively red and yellow, monohydrates, $\text{Fe}_2\text{O}_2(\text{OH})_2$, and bihydrates, $\text{Fe}_2\text{O}(\text{OH})_4$, and publishes the following distinctions:

The red bihydrate remains unaltered up to 50°C . and the yellow to 105°C .; the red monohydrate to 92° and the yellow to 150°C . The red hydrates, when dehydrated, leave as a residue a brown oxide having the density 5.1, while the yellow hydrates leave a red or reddish-yellow oxide having the density 3.95. The red hydrates dissolve even in dilute acids, while the yellow are scarcely soluble in concentrated acids. The red hydrates are readily dissolved by ferric chloride solution, and this solution yields, on the addition of sodium sulphate or sulphuric acid, a precipitate of hydrated oxide; the yellow hydrates are insoluble in ferric chloride. The red hydrates are entirely dehydrated by boiling, while the yellow are only reduced to monohydrates. Tommasi considers the combinations of ferric hydrates with ferric salts mere mechanical mixtures and not chemical compounds.—*Ber. d. Deutsch. Chem. Ges.*, 1879, p. 1929.

Determination of Metallic Iron in Reduced Iron.—G. Vulpius proposes the following process: Digest 1 gram of the iron for one hour with a solution of 5 grams of pure copper sulphate in 25 grams of water, acidulated with 2 drops of dilute sulphuric acid, filter into a previously weighed flask, wash the filter with sufficient distilled water to obtain 50 grams of filtrate, add 1 gram of pure powdered iron (the percentage of carbon contained in it should be previously determined), digest until all the copper is precipitated in a metallic state, add 5 grams

of pure concentrated sulphuric acid and heat slowly to boiling, and until the iron is completely dissolved, when the precipitated copper will alone remain, contaminated with a little carbon. Wash it repeatedly by decantation with water, afterwards with alcohol, absolute alcohol and ether, dry the flask quickly by heat, weigh, and from the weight of the copper subtract the carbon of the powdered iron (about 0.01 gram). Since the difference between the weight of this precipitated copper and the total weight of the metallic copper (1.271 gram) contained in the 5 grams of crystallized sulphate equals the quantity of the copper, which was precipitated by the metallic iron contained in 1 gram of the reduced iron, the percentage of the unoxidized metal is readily determined from the ascertained weight, and the relation between the atomic weights of copper and iron. The number of centigrams of iron calculated from the copper which was precipitated in the first part of the process indicates directly the percentage of the metallic iron contained in the reduced iron.—*Archiv d. Pharm.*, Dec., 1879, p. 508.

Detection of Ammonia in Water.—Ammonia is usually present in water as carbonate, but frequently in such small quantities that it cannot be detected by the ordinary tests. In such cases Hager ascertains its presence by mixing 2 to 3 liters of the water with 20 drops hydrochloric acid, evaporating to dryness, dissolving the residue in 10 or 15 cc. distilled water, filtering, and applying Bohlig's test, which consists in adding, first, 5 drops of solution of corrosive sublimate (1 part in 30 parts of water), and then 5 drops of solution of potassium carbonate (1 part in 50 parts of water), when a cloudiness indicates the presence of ammonia.—*Pharm. Centralh.*, Dec. 25, 1879, p. 474.

An Acid and a Neutral Ammonium Valerianate are distinguished by Hager, who reports that the commercial ammonium valerianate is always the *acid salt*, which consists usually of handsome crystals, having an acid taste and reaction, and readily decomposed unless kept in tightly stoppered bottles. The decomposition is proved by its penetrating odor and the strongly rotating motion of the crystals when thrown on cold water; this rotation is an excellent test for identifying the salt.

Neutral Ammonium Valerianate is obtained with the greatest difficulty in prismatic crystals by the action of anhydrous ammonia on the monohydrated acid at a low temperature; the crystals of the neutral salt liquefy even at a moderate temperature, without, however, absorbing moisture. Hager thinks that physicians, when ordering ammonium valerianate in pills or in any other solid shape, want the acid valerian-

ate, and when ordering the salt in a mixture, invariably wish the neutral salt, which can be readily kept unaltered in solution for such purposes. Ammonium valerianate is considered an excellent stimulant and anti-neuralgic remedy, and is usually given in doses of 0.2 to 0.4 to 0.6 gram every two or three hours.—*Ibid.*, 1879, p. 465.

Pure Valerianic Acid.—The so-called monohydrate is now a commercial article, and in Hager's opinion should be made officinal, especially since the trishydrate of the market is rarely pure and contains more or less monohydrate. The pharmacopœia should require it to be tested for butyric acid and for amylic alcohol. For butyric acid the author uses copper acetate, and for testing for valeraldehyd he mixes 2 grams of the acid first with 3 grams of caustic ammonia, and then with about 150 grams of cold water. After agitating the mixture well it should remain either entirely clear, or possess merely a very slight opalescence.—*Ibid.*, Jan. 8, 1880, p. 13.

Contamination of Benzoic Acid with Corrosive Sublimate.—Spoerl purchased benzoic acid from a well-known chemical laboratory, and found it to be contaminated with a not inconsiderable quantity of corrosive sublimate. From information received from the seller, it appears that the acid had been obtained from England. It is possible that this accidental contamination was caused by subliming the acid in an apparatus previously used for corrosive sublimate and not properly cleaned.—*Archiv d. Pharm.*, Dec., 1879, p. 517.

Benzoic Acid in the Berries of Vaccinium Vitis-idaea.—The cowberries resist fermentation and decomposition for a long time, on which account Naegeli supposed the presence of an antiferment. O. Læw isolated from them benzoic acid by distilling the expressed juice repeatedly with water, neutralizing the slightly acid distillate with soda, concentrating considerably, and adding dilute sulphuric acid. Benzoic acid was precipitated as a crystalline magma, and the supernatant liquid contained a little formic acid.—*Ztschr. d. Oest. Apoth. Ver.*, Dec. 20, 1879, p. 543, from *Jour. f. Prakt. Chem.*

Teucrium fruticans, L., N. O. Labiatæ, indigenous to Southern Europe, called "Olivetto" by the Italian peasants on account of the resemblance of its leaves to olive leaves, was subjected to a chemical analysis by Ogliastro, who states that it contains no volatile oil, but teucrin, a substance containing no nitrogen, crystallizing in slender yellow prisms, scarcely soluble in the ordinary solvents except in glacial acetic acid, and transformed by dilute nitric acid into an acid

which is supposed to be hydroxytoluic acid. Dilute sulphuric acid also decomposes teucrin, when boiled with it, into an acid and glucose.—*Pharm. Ztg.*, Jan. 3, 1880, p. 3, from *Gazz. Chim. Ital.*

Heracleum giganteum hort., *Pastinaca sativa*, L. and *Anthriscus cerefolium*, *Hoffm.*, were analyzed by Dr. Gutzeit, who found free ethylic and methylic alcohol in the distilled waters of the unripe fruits, and proved the existence of ethylbutyrate in those portions of heracleum oil having the lowest boiling point, and the certain existence of solid hydrocarbons, belonging to the paraffins, and having the general formula C_nH_{2n} . The author isolated also a new crystalline substance "heraclin," $C_{32}H_{22}O_{10}$ from the unripe fruits of heracleum and pastinaca. This heraclin is an odorless and tasteless substance containing no nitrogen, melts at almost $185^{\circ}C$., and crystallizes from alcoholic solutions in white, brilliant, silky needles, grouped in the shape of stars, gradually turns yellow, does not react with litmus-paper, is insoluble in water, readily soluble in chloroform, difficultly soluble in ether, soluble in 1,200 parts of cold and in 400 parts of boiling carbon bisulphuret, in 700 parts of cold and in 60 parts of boiling absolute alcohol.—*Ibid.*, Nov. 12, 1879, p. 703, from *Sitzungsb. d. Jena Ges. f. M. u. Nat.*

Pilocarpina.—A. Poehl recommends its preparation by extracting jaborandi leaves with hot water acidulated with 1 per cent. of hydrochloric acid, precipitating by solution of lead subacetate, concentrating the filtrate, adding phospho-molybdic acid, washing the heavy flocculent precipitate with water acidulated with hydrochloric acid, drying with baryta water on a water-bath, and extracting the pure alkaloid from the residue by chloroform. Thus prepared, pilocarpina is a soft, tough, colorless mass, soluble in water, has the formula $C_{23}H_{34}N_4O_4$ (Kingzett), after being dried at 100° , is not volatile, and begins to be decomposed at $180^{\circ}C$. The leaves appear to contain only one alkaloid. In regard to the volatile oil of jaborandi, Poehl states that the properties of the hydrocarbon *pilocarpene*, $C_{10}H_{16}$, which distills over between 174° and 176° are so similar to those of *carvene* of oil of caraway that he considers them to be identical.—*Ibid.*, 1879, p. 718.

Duboisinic Acid and *Piturina*, from *Pitury*—the dried branches and leaves of *Duboisia Hopwoodii*. F. von Mueller and L. Rummel isolated duboisinic acid in colorless rhombic prisms and tabular crystals, having a slightly acid reaction and a slightly bitter taste, and being soluble in water and alcohol. They obtained also 1 per cent. of an alka-

loid as a thick, strongly alkaline, brown, oily liquid, heavier than water, combining readily with acids, and possessing a strong, burning taste, and an odor resembling tobacco. Even at ordinary temperatures it irritates the eyes, nose and throat, and in the presence of hydrochloric acid forms white clouds. It dissolves in every proportion in water, alcohol and ether, and greatly resembles nicotina. The authors at first supposed this alkaloid to be identical with the alkaloid isolated from *Duboisia myoporoides*, but were convinced by further investigations that the two alkaloids differ considerably, both in regard to their physiological action and also in chemical and physical respects, for which reason they suggest the adoption of the name *Piturina* for the alkaloid of *Duboisia Hopwoodii*, and favor the retention of the name *Duboisina* for the alkaloid of *Duboisia myoporoides*. The yield of the latter alkaloid, obtained by the authors from the fresh (cultivated) plant, amounted to 0.55 per cent.—*Ztschr. d. Allg. Oest. Ap. Ver.*, Jan. 10, 1880, p. 21.

Are Swedish Safety Matches Poisonous?—Hamberg found them to contain, besides amorphous phosphorus, which, when pure, is not poisonous, also antimony, arsenic, ordinary phosphorus and a large percentage of potassium bichromate, thus proving them to be very poisonous. The arsenic is attributed by Hamberg and Dr. S. Jolin to the impure amorphous phosphorus used in the preparation of the matches, and this was found to contain almost 2 per cent. of ordinary phosphorus and nearly 1 per cent. of arsenic.—*Archiv d. Pharm.*, Dec., 1879, p. 518.

Antidote for Carbolic Acid.—Husemann recommended several years ago saccharated lime (a solution of caustic lime in sugar-water) for neutralizing the poisonous effect of carbolic acid, while Sanftleben claims to have found an antidote in sulphuric acid, which, according to his statement, enters into a not poisonous combination with carbolic acid; he prescribes the following:

R	Dilute sulphuric acid,	.	.	.	.	.	10 grams.
	Muc. of gum arabic,	.	.	.	.	.	200
	Simple syrup,	.	.	.	.	.	30

Mix, and give a tablespoonful every hour.

—*Ztschr. d. Allg. Oest. Apoth. Ver.*, Jan. 10, 1880, p. 10, from *Pharm. Ztschr. f. Russl.*

Chloral hydrate as an Antidote.—Th. Husemann states that

1. Chloralhydrate is an excellent antidote for strychnia and other poisonous vegetable alkaloids which cause convulsions. In order to

prove effective it must be given in sufficiently large doses, not less than two and not more than three grams to adults, and in case the convulsions reappear after the sleep produced by the chloral, one-half of the former dose is given.

Chloral hydrate ought to be given internally when possible, but may be injected into the rectum, or hypodermically if the patient cannot swallow it. It was found to prevent the death of rabbits poisoned with five times a fatal dose of strychnia.

2. As an antidote for ammonium salts, chloralhydrate is not only not efficacious, but even deleterious, since it was found to shorten the life of poisoned animals.

3. Chloral hydrate was found by Browne and Amagat to merely prolong the life of rabbits to about eight times the usual duration of a fatal intoxication by picrotoxin.

4. Chloral hydrate will not prevent death by overdoses of santonin or sodium santonate, according to Binz and Becker, although it was observed to prevent convulsions if previously administered.

5. Chloral hydrate was found by Husemann and Wehr to counteract almost twice the fatal dose of codeia, but no more. However, it greatly prolonged the life of animals poisoned with twice the fatal dose or larger doses. The authors consider it nevertheless far less reliable than the usual antidotes for codeia.

6. Chloral hydrate is no antidote for barium chloride, carbolic acid or calabarina.—*Archiv d. Pharm*, Dec., 1879, p. 481–508.

PREPARATION OF MERCURIAL OINTMENT.

BY E. DIETERICH.

Translated and abridged from "Pharm. Centralh.," Jan. 1st and 8th, 1880, by
LOUIS VON COTZHAUSEN, Ph.G.

Few preparations have ever been so much experimented with as mercurial ointment, and have busied the inventing brain of as many pharmacists, whose researches ultimately terminated in suggesting a formula of their own for preparing it. Having tested all those methods which did not seem too absurd, in order to be able to pass judgment on their respective merits, and to compare them with my own experience in its manufacture, I report in the following my observations with the different processes arranged in the chronological order of the latter:

1. Reinsch proposed 1 part of turpentine and a little alcohol to 18 parts of mercury. The turpentine is contrary to the directions of the German Pharmacopœia; his method of extinguishment yields satisfactory results, especially if absolute alcohol is used.

2. Heusler adds ether. Ether, petroleum naphtha, chloroform, etc., aid momentarily in dividing the mercury; as the evaporation continues, almost all the mercury separates again.

3. Reinige employs steam power, and adds sulphuretted oil of turpentine. I agree with him in using steam-power, but consider the addition unsuitable, and therefore did not test its efficacy.

4. Lœwel attaches a mixture of olive oil and mercury to the saw of a saw-mill, and extinguishes by shaking. This process is recommended by many, but seems unsuitable for making large quantities. I, like most others, had no facilities to test this method.

5. Luederson states that a darker colored ointment is obtained by long-continued trituration, caused, in his opinion, by the formation of black oxide. I consider this correct as far as the color is concerned, but do not believe in his explanation, since I always obtain the dark colored ointment by triturating with steam-power for 5 or 6 hours, in which short time a formation of black oxide seems impossible.

6. Guibourt mentions 1.715 as the specific gravity of an ointment made in the proportion of 1 to 2, while Buchner found it to be 1.330. Hager agrees with the latter, while I found it to be 1.32 to 1.34.

7. Heauly suggests in the place of the saltpetre, which was recommended by Polmonté, an addition of 6 parts of potassium sulphate to 500 parts of mercury. Both plans were not tried by me.

8. Mouchon adds one-fifth stearic acid, which I tried without success.

9. Snoep recommended boiling the fatty matter to be used for some time with water, then dehydrating it, and claims to have obtained usually favorable results. The process was not satisfactory in my hands.

10. Coldefier spreads 500 grams of lard under a bell-glass, in a thin layer, so as to increase its surface, and then suspends above it a piece of phosphorus for 15 days; the ozonized lard is then transferred to a wide-mouthed bottle, 250 grams of mercury are added, and heat is applied until the lard begins to flow, when the mixture is well shaken for some time, and the ointment is finished by quickly cooling with immersion in cold water. I made use of the first portion of this sug-

gestion, not believing in the second; *i. e.*, I used ozonized lard for triturating, but not for shaking with the mercury; the ointment was completed in a much shorter period than with pure lard, but a much longer time was required than with old ointment.

11. Overbeck thinks that old ointment contains mercury in combination, and thus explains the success with it in extinguishing. I shall prove that this is not the case.

12. Geissler recommends steam-power as it is used in England, the machine used consisting of a circular iron trough, constantly kept in a rocking motion, in which two iron balls take the place of the pestle. A porcelain apparatus, constructed on the same plan, is used for dissolving indigo in sulphuric acid. I believe that it is far superior to manual labor for preparing the ointment, although I do not see any extraordinary virtues in it.

13. Prof. Ludwig's plan was to precipitate the mercury in globules, invisible to the naked eye, from a solution of nitrate of mercury, by conducting sulphurous acid gas into it, and, after washing it, to mix it with the fatty matter. I did not try this method, but believe that it would be used more extensively if it yielded reliable results.

14. Magnus triturates with almond oil and Peruvian balsam. The oil was tried by me unsuccessfully, while the balsam seemed objectionable to me, for which reason I did not test its efficacy.

15. Another author suggests 2 parts of lard and 1 part of Japan wax, which mixture is less adapted for extinguishing the mercury than lard alone.

16. Adolph Brejcha uses glycerin ointment, with which I obtained very unfavorable results.

17. Wallet suggests adding the mercury in small quantities, gradually, to the fat, and extinguishing each portion entirely before adding another. This is a very sensible suggestion, and will always yield a good ointment in a comparatively short time.

18. Another author claimed, four or five years ago, that lard containing no water is equally well adapted as old ointment. I cannot corroborate this statement, but find that it does not extinguish the mercury any quicker than lard containing water, although I consider the former far preferable for preparing any ointment, since the absence of water is the best remedy for preventing rancidity.

19. Supposing that rancid fat extinguishes mercury more quickly than not rancid fat, and attributing this apparently greater affinity for

mercury to the presence of fatty acids, somebody suggested to add a few drops of olein to the fatty matter used for triturating. The mass turns foamy when triturated without mixing with the mercury.

20. Donovan thinks that the metal is first transformed into mercurous oxide before it dissolves in the fat; that it is only efficacious in solution, and that the balance of the metal is wasted and useless; in order to obtain an ointment containing no free metal, the oxide is to be digested with the fat for some time at 150 to 160° ; the mixture is then cooled and triturated. I did not try this suggestion.

21. Godeffroy uses vaseline instead of the old ointment, and claims to obtain a perfect ointment in a shorter time. I tried the plan on a large scale, and obtained in two minutes a uniform grayish-white mixture, containing numerous metallic globules; the mercury was extinguished to an equal extent in two minutes as it was when triturated with old ointment for 10 to 15 minutes. I then supposed vaseline to be the best vehicle, but soon became aware of my mistake, since further trituration for eight days produced no noticeable change in the ointment, the mercury being apparently no more extinguished than it was at the end of the first two minutes. I therefore suppose that Godeffroy commenced the trituration with the pestle, and continued it with pen and ink.

22. Lautenschlaeger conducts ozone into melted lard, and extinguishes the mercury with the ozonized lard in a remarkably short time. I see no particular gain of time in this process, and prefer old ointment as a vehicle.

23. Kenzel made a celebrated blue ointment in the eighteenth century by adding 6 grains of sulphur to 2 ounces of the lard; thus a very efficacious ointment is obtained in a short time.

24. Hager suggests either old ointment or a mixture of 1 part of wax, 1 part of tallow, and 3 parts of olive oil. The latter mixture is far inferior to old ointment, and will only prove successful in connection with absolute alcohol.

Attempts to prepare an ointment with lard, to which an alcoholic or an aqueous potassa solution had been added, yielded unsatisfactory results.

In almost all these experiments I used steam-power, and feel fully convinced by the results that

1. The best vehicle for extinguishing the mercury is not "old ran-

cid ointment," but "ointment," either old or fresh. (I frequently use blue ointment made the day before.)

2. The mercury ought to be added gradually.

3. The specific gravity of the completed ointment ought to be between 1.32 and 1.34.

4. No rancid fats should be used in its preparation.

5. The excellent results obtained with old ointment as a vehicle are not due to the rancidity of the ointment, but the affinity for larger quantities of mercury depends greatly on the degree of uniform extinguishment of the mercury in the vehicle.

I determine the percentage of mercury in a commercial mercurial ointment by Hager's method, modifying the latter, however, by using ether instead of benzin for dissolving the ointment; the mercury soon settles, and after washing six or seven times in a narrow but tall cylindrical glass vessel, the last traces of ether may, by a moderate heat, be readily removed from the sediment, which is then weighed.

MANUFACTURE of OLIVE OIL in SOUTHERN FRANCE.

Translated from "Phar. Handelsbl.," Jan. 14, by LOUIS VON COTZHAUSEN, Ph.G.

In the establishment of E. Jourdan de Jauffret et Fils, at Salon in the Provence, the manufacture of olive oil necessarily always begins in the first half of November, because the olives become ripe in this season in the Provence, and, when begun, it must be continued night and day for three or four months, the length of the season, of course, depending on the duration of the harvest.

De Jauffret & Son employ eighteen laborers, who are divided into two divisions, working respectively during the day and during the night, and producing daily 1,200 kilograms of the best oil from 1,000 dekaliters of olives. The facilities of the establishment are such that the largest harvests of olives can be handled quickly, so as not to necessitate a prolonged storing of olives, which would cause them to ferment, when they yield an inferior oil.

Nevertheless, there are some manufacturers who believe in this fermentation, claiming that it increases the yield because it assists the separation of the oil from the cellular tissue of the olives. But experience has shown that this increase in yield can only be obtained at the expense of the quality of the oil, and that the larger yield never makes up for the inferiority of the oil.

In the establishment of Jourdan de Jauffret this is avoided. Nevertheless, their manner of preparing the oil is such that fully as much, if not more, is obtained by them as by those allowing the olives to ferment. Before the olives enter the mills they are carefully spread over the floor of the well-ventilated store-room, where they are allowed to remain for three days, if the wind is from the south, and four or five days if from the north. The first stage of the manufacture consists in grinding the olives between revolving granite stones; then the mass, enclosed in baskets, is exposed to a slight pressure in an iron press, and yields the so-called virgin oil (*huile vierge*), which has gained the good reputation for the oil of the Provence. The mass in the baskets is then exposed to a stronger pressure, and yields the well-known good oil usually found in commerce. After this second operation, the mass is taken from the basket-work, and is again placed into the mills, where it is thoroughly ground up, when it is again packed into baskets and is exposed to the pressure of hydraulic presses.

During this operation the effect of fermentation is made use of by treating the mass with boiling water, in order to facilitate the separation of the oil from the cells, which still retain it. Thus, a larger yield is obtained from the olives without interfering with the quality of the greater portion of the oil, since only the last yield is exposed to heat. This oil is always better than the oil obtained from fermented olives, because frequently a rotten odor is produced by fermentation, which is imparted even to the oil expressed first.

The oil expressed with the aid of hot water is known in commerce as fine table-oil. The greatest precautions must be used in the manufacture. Columelle even forbids the kindling of fires in the mills during the manufacture, claiming that the smoke of a single lamp may prove injurious to the quality of the oil. This caution is necessary in the older mills. Even at the present time, most mills are under ground, and of such a construction that air and light can scarcely penetrate into them, and that foul odors, etc., can scarcely escape from them; besides, most of the mills are revolved by mules, which adds to their uncleanness.

The olive oil must be preserved with great care, since Th. de Saussure has shown that the absorption of atmospheric oxygen, which is favored by heat, has a tendency to turn it rancid. The expressed oil is filtered, and immediately transferred into large cooled stoneware jugs, in which it gets cold very soon, and will keep unaltered for two years.

“Waste-oil” (*huile d'enfer*) is the name given to all oil in the Pro-

vence which is collected on the surface of the pits. It is treated with caustic soda and with hot water, in order to remove the fatty acids, and then enters commerce as lubricating machine-oil. It is greatly valued for oiling machinery, and also for wool.

CINCHONA CULTURE FOR THE PACIFIC COAST.

Mr. Willis Weaver, of Bogota, South America, has written a long letter to the Department of Agriculture, advocating the introduction of the cinchona tree in California.

After reviewing the conditions under which the cinchona tree thrives naturally in South America, and, under cultivation, in India, Mr. Weaver says: "The cinchona seems to seek a dry soil, but a climate affording plenty of rain in certain parts of the year. The coasts of Northern California and Oregon would fulfill the conditions as to moisture; the slopes of the mountains would probably furnish hilly ground very similar to that occupied by the tree in its native habitat; while I believe that the temperature would admit of its cultivation even north of the mouth of the Columbia. It is also uncertain, as to how far any undue dryness of the atmosphere may be overcome by irrigation. The surprising results already attained in the cultivation of the trees prepare us to expect further advances, and this may be one of them as naturally as anything else.

"It is well known that the barks produced under cultivation are much superior to the natural bark, as the process of mossing the tree causes a remarkable development of the alkaloids in which their virtue consists; also, that the cultivated trees are not destroyed. A strip is taken off reaching the length of the trunk and one-third its circumference. The wound is then dressed with straw matting, and kept wet until the bark forms anew. The next year another strip is taken, and so on, indefinitely. I am told that the harvest begins when the tree is five years old, but am not in a position to verify the statement.

"I have calculated roughly, according to the prices of land and labor here, that a plantation of a hundred acres might be put in at less than \$1,000 an acre, covering all outlay, or say \$1,500 to cover interest and all contingencies."

A yield of \$8,000 an acre has been reported from Indian plantations. Mr. Weaver is convinced that with a wise choice of sites and judicious treatment, together with a careful selection of the proper varie-

ties, the cinchona tree could be cultivated in many parts of the Pacific coast, and probably in New Mexico; that if irrigation can be made to supply the place of a naturally moist climate, the cultivation can be carried into a large part of the Colorado Valley and Texas, as well as into Northern Georgia and Alabama, and thence north along the southern slope of the Blue Ridge. He would not be surprised if the hardier varieties were found to grow even in Virginia and Colorado and in Arkansas, in favored situations on the southern slopes of the Ozark mountains.—*Sci. Amer.*, Feb. 28, 1880.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER.

Inorganic Chemistry.—*The Chemical Cause of the Poisonous Nature of Arsenic.*—The old theory proposed by Liebig that arsenous acid, like corrosive sublimate, formed an insoluble compound with albumen, and hence decomposes the animal tissues, has been given up since it has been found experimentally that these supposed albuminates are not formed by the action of arsenous acid or its salts. Binz and Schulz find that arsenic acid, digested with egg-albumen and fibrin of warm-blooded animals, at the temperature of the body, is reduced. They find that the mucous membrane of the stomach, the liver and the undecomposed protoplasm of plants *reduce* arsenic acid and also *oxidize* arsenous to arsenic acid. The authors find in this alternate oxidation and reduction, which the two arsenic acids undergo when in contact with the albumen molecules, the reason for the decomposing effect which arsenic in its several forms exerts upon the tissue, or, in other words, for its poisonous character. They draw an analogy with the poisonous effects of nitrogen dioxide, which is also a carrier of oxygen, passing into nitrogen tetroxide, and then, in the presence of water, regenerating nitrogen dioxide. Phosphorus and antimony, they consider as showing similar characters.—*Ber. der Chem. Ges.*, xii, p. 2199.

Arsenic in Grape Sugar.—Clouet and Ritter have found, independently, that all commercial grape sugar contains arsenic in small quantities; according to Ritter the amount varies from .0025 to .1094 gram per kilo. The arsenic is probably derived from the sulphuric acid used in the manufacture.—*Bied. Centr.*, 1879, p. 477.

On the Preparation of Sub-nitrate of Bismuth Free from Arsenic.—R. Schneider has found that sub-nitrate of bismuth, free from arsenic,

can be made from bismuth containing arsenic by adding the coarsely powdered metal gradually to five times its weight of nitric acid, heated to between 75° and 90°C. , and by application of heat, keeping the reaction going actively. There is formed by the oxidation of the arsenic, bismuth arsenate, which Schneider has found is insoluble in a concentrated solution of bismuth nitrate, and separates out as a white powder. After the settling out of the arsenate, the solution is filtered through asbestos, evaporated to crystallization, and the neutral salt so gotten changed into the basic salt by the usual method.—*Jour. für Pr. Chem.*, p. 20.

Combustion of Hydrogen Sulphide Gas in Nitrous Fumes.—Kessel describes an interesting experiment in which this combustion is beautifully shown. In a half-liter flask 60 to 80 cc. of cold fuming nitric acid (1.53 specific gravity) is poured, and a rapid stream of sulphuretted hydrogen gas, purified by passing through a wash-bottle, is passed into the acid. This becomes rapidly heated and the flask is filled with red fumes. If now the delivery-tube of the gas be withdrawn from the acid, and slowly raised to the mouth of the flask, the hydrogen sulphide gas ignites and burns with a bluish flame, tinged with a reddish-yellow color. If the flame becomes extinguished the addition of fresh acid calls it forth again. The neck of the flask becomes filled during the combustion with white sulphuric acid vapors, while the space below the flame remains filled with red fumes. If the combustion proceed properly very little, if any, sulphur separates out.—*Ber. der Chem. Ges.*, xii, p. 2305.

Organic Chemistry.—Digestive Ferment of Carica Papaya.—A description of this, the so-called melon tree, appeared in this journal November, 1879, p. 559. A. Wurtz and E. Bouchut have made an examination of the juice obtained from incisions in the bark of the tree. This juice separates spontaneously into two portions, an insoluble pulp and a limpid, colorless liquid. From the latter of these alcohol precipitates a body which, after suitable purification, presents the characters of a strong digestive ferment, resembling that secreted by carnivorous plants. When pure, it is an amorphous white powder, entirely soluble in water—a property which shows the absence of vegetable albumin. It contains 10.6 per cent. of nitrogen. Its aqueous solution has an astringent taste, gives an abundant precipitate with alcohol, also with nitric acid, soluble in excess to a yellow liquid; acetate of lead and tannin also precipitate it from its solution. Placed in contact with

moist fibrin in slightly acid, neutral or slightly alkaline solution, it dissolves large quantities of that substance, the fibrin first softening, then disintegrating without swelling and dissolving, leaving a residue of dyspeptone. The above-mentioned pulp, even after careful washing, presented similar characters.—*Compt. Rend.*, No. 89, p. 425.

Action of the Sap of Carica Papaya.—L. Wittmak finds that the sap of *Carica papaya* contains a ferment analogous to pepsin, from which it is distinguished by its acting upon milk quickly without addition of acid. On boiling a solution of the sap, or on adding mercuric chloride, iodine or mineral acids, a precipitate is formed. This substance resembles pepsin in being precipitated by neutral lead acetate, but not by potassium ferrocyanide or ferric chloride. One milligram of the dried sap coagulated 10 cc. of milk at 35°.—*Journ. Chem. Soc.*, Nov., 1879, from *Bied. Centr.*, p. 475.

Change of Piperidina into Pyridin.—Within the last few years pyridin derivatives have been gotten from a number of the alkaloids, as, for example, from the several quinia bases, from nicotina and from berberina. W. Koenigs has now obtained pyridin, C_5H_5N , from piperidina, $C_5H_{11}N$, the base which is produced at the same time with piperic acid by the decomposition of the alkaloid piperin. This change was effected by heating the piperidina for some hours with an excess of sulphuric acid to about 300°C. During the process a steady evolution of sulphurous acid gas took place, but no coaking was observed. The base extracted with ether, and purified, was converted into the platinum double salt, and analyzed.—*Ber.*, xii, p. 2341.

Action of Potassium Ferricyanide upon Morphia.—Polstorff has examined the product of the oxidation of morphia by potassium ferricyanide, and has obtained a well-crystallized very stable base of the composition $C_{34}H_{36}N_2O_6$. This he names oxydimorphia, considering that it has formed by the elimination of one atom of hydrogen from each of two molecules of morphia, $C_{17}H_{19}NO_3$, and the linking together of the residues, thus: $\begin{array}{c} C_{17}H_{18}NO_3 \\ | \\ C_{17}H_{18}NO_3 \end{array}$ He prepared and analyzed the sulphate and the chlorhydrate of this base.—*Ibid.*, xiii, p. 86.

Other Methods of Formation of Oxydimorphia.—Polstorff and Broockmann have also repeated Schützenberger's ("Bul. de la Soc. Chim.," 1865, No. 4, p. 176) preparation of oxymorphia by the action of silver nitrate upon morphia hydrochlorate, and find that the base so obtained

is in reality oxydimorphia, identical in all respects with that prepared by themselves in the way before mentioned. They also examined the action of potassium permanganate upon morphia in the presence of alkaline carbonate. Flückiger ("Handbook of Pharmac. Chem.," p. 375) states that oxymorphia is obtained under these circumstances. The authors find that this product is also oxydimorphia, as is proved by the analysis of the base, the sulphate and the hydrochlorate. They have also prepared the oxydimorphia by the action of atmospheric air upon morphia when in ammoniacal solution. A very dilute solution of morphia hydrochlorate (1 to 600) is supersaturated with ammonia solution, and then allowed to stand in open vessels for a long time in contact with air. The crystalline deposit, purified by crystallization, proved to be identical with those before described.—*Ber. der. Chem. Ges.*, xiii, p. 86.

On the Preparation of Artificial Alkaloids.—A. Ladenburg has followed up his formation of artificial atropia (this journal, 1879, p. 398), by a comparison of its properties with those of the natural alkaloid, showing entire correspondence. These results, awakened the hope that by the treatment of other tropin salts with hydrochloric acid other bases analogous to atropia might be obtained. This hope has been fulfilled, and it seems possible to form a whole class of artificial alkaloids which the author calls tropeins. He has prepared *salicyl-tropein*, *oxytoluyl-tropein* and *phtalyl-tropein*. Of these the salicyl-tropein is a weak poison, and has no effect upon the pupil of the eye. Oxytoluyl-tropein, or homatropin, as he proposes to call it, however, acts upon the pupil of the eye almost as strongly as atropia itself, and in its mydriatic action it seems to exceed in many cases atropia, so that it may have a therapeutic value. The phtalyl-tropein has not been sufficiently studied as yet. The author considers it likely that hyoscyamia and duboisina also belong to the class of tropeins. These he proposes to investigate immediately, as also belladonia.—*Ibid.*, p. 104.

Miscellaneous.—*Ancient Samples of Butter.*—Wigner and Church read a paper before the English Society of Public Analysts on this subject. The first sample was of Irish bog butter, and its probable age was judged to be about one thousand years. The sample contains nearly 4 per cent. of curd, which consisted partly of vegetable matter derived from the bog, but contained quite enough animal matter to prove that the butter had been originally made from animal milk and was not a mere artificial fat. Its fatty character has, however, been

entirely changed, and the glycerides, of which the fat had originally consisted, had been decomposed so as to leave simply a mixture of the fatty acids, which constituted the acid portion of animal fats. The butter had in fact become changed into a substance closely resembling, in character and composition, the substance of which good composite candles are made. The result is singular as showing that length of time, combined with exposure to moisture, will effect the decomposition which the manufacturer of stearin has to effect by the agency of heat and acid. The other and older sample of butter had been taken from an alabaster vase in an Egyptian tomb; it had evidently been melted and poured into the vase, and carefully sealed over. This sample was probably about 2,500 years old, but the preservation had been so perfect that it was only slightly rancid and had fully retained the chemical properties of genuine butter, the fat not having been decomposed to any sensible extent. This sample possessed a decided taste and smell of butter, while the sample from the bog was cheesy rather than buttery in smell.—*Chem. News*, Jan. 23, 1880.

ON THE RELATIONS OF THE ACIDS OF NITROGEN TO SULPHURIC ACID.

BY G. LUNGE.

Our knowledge of this relation is not by any means complete. It is well known that nitrous acid, either in the liquid or gaseous form, or produced nascent from the union of nitrogen dioxide with oxygen, is dissolved by sulphuric acid of about 1.7 specific gravity; but the behavior of nitrogen tetroxide toward sulphuric acid is not accurately known. The author has shown that it is dissolved by sulphuric acid, forming nitrosulphuric and nitric acids; but according to Weber and Winkler, nitrogen tetroxide is dissolved as such by sulphuric acid of 66°B., producing a reddish-yellow solution, which, when heated, gives off nitrogen tetroxide with violent ebullition, and leaves a liquid having the properties of nitrosulphuric acid. Winkler stated that 28.072 grams of sulphuric acid at 60°B. absorbed 7.397 grams of nitrogen tetroxide, but that on heating gently, the latter was entirely expelled. Weber describes the effects of nitrogen tetroxide on sulphuric acid of different specific gravities, but only qualitatively: thus, sulphuric acid at a specific gravity of 1.7 absorbs nitrogen tetroxide without becoming colored; hence it was assumed that the latter was decomposed; at a

specific gravity of 1.55 the sulphuric acid becomes yellow, and hence it was supposed that the greater part of the nitrogen tetroxide was simply dissolved. Acid of 1.49 specific gravity takes a greenish-yellow color; acid of 1.41 specific gravity takes an intense green color; acid of 1.31 specific gravity becomes blue and liberates nitrogen dioxide, which escapes with violent ebullition on gently heating. The green and blue colors were supposed to be due to the formation of nitrous acid, the nitrogen tetroxide having been decomposed into that substance and nitrogen dioxide. As these results are very important to vitriol manufacturers, the author studied them more accurately, and, as far as possible, quantitatively. The nitrogen tetroxide, prepared from dry fused lead nitrate, was measured off from a burette, and mixed with pure sulphuric acid, which had been diluted to different strengths with water, and the effects of heat upon these mixtures were also noted.

The following are given as examples of the method employed and of the results obtained by the author in carrying out the experiments:

100 cc. sulphuric acid of 1.84 specific gravity, to which was added 2 cc. = 3 grams liquid nitrogen tetroxide, gave a colorless solution with a very feeble odor, recalling that of ozone. The amount of nitrogen dioxide evolved from 1 cc. of this solution in the nitrometer was determined, and also the amount required to decolorize 10 cc. seminormal potassium permanganate solution. From the results, the author calculates that his nitrogen tetroxide contained of pure nitrogen tetroxide 93 per cent., and of nitric acid 7 per cent.; but he argues, as in reality the nitrogen tetroxide does not exist as such in the sulphuric acid, but has undergone a decomposition, one part of the tetroxide having been converted into nitric acid at the expense of the oxygen of the other part, whilst the part which has been robbed of its oxygen remains as nitrous acid in combination with the sulphuric acid; then assuming that this lower oxide takes the oxygen from, and decolorizes the potassium permanganate, this would give 46.5 per cent. as nitrous acid, and 53.5 per cent. as nitric acid. The other calculations are made on this supposition, that is, it is first assumed that all the nitrogen tetroxide remains as such, and the deficiency in the theoretical amount of oxygen required is calculated as nitric acid; but if, on the contrary, the amount of oxygen required be less than that found by the permanganate process, then he assumes that no nitric acid is present, but that nitrous acid must have been originally present as an impurity.

(I.) The acid was heated to 280° , and kept at that temperature for

one hour ; any free nitrogen tetroxide, if it were present, must have been thus expelled. When the temperature rose to 200° , a little red vapor was evolved, and the liquid acquired a golden-yellow color ; but on cooling, it again became colorless.

On analysis the author calculated that 77.9 per cent. of the nitrogen present existed as N_2O_3 , and 21.1 per cent as HNO_3 ; there is consequently, he says, a large amount of the nitric acid driven off and another part changed into nitrous acid.

(II.) On continuing to heat for one hour longer, a further change took place of the same kind, and 94.5 per cent. of the nitrogen remaining existed as N_2O_3 , in combination with the sulphuric acid forming nitrosulphuric acid ; whilst 5.5 per cent. remained as HNO_3 , and 18 per cent. of the nitrogen originally present having been expelled by the heating.

(III.) Another experiment was made by adding pure nitric to pure sulphuric acid, and analyzing the resulting mixture, but no change was found to have taken place.

(IV.) On boiling the mixtures for half an hour, however, red fumes were given off, and the whole of the nitrogen present was converted into nitrous acid, which was found in combination with the sulphuric acid.

That nitric acid is thus broken up has also been demonstrated in another way by Winkler, who collected the oxygen which was evolved from the decomposition.

The author did not find the same result as Winkler with sulphuric acid of $66^{\circ}B$. above mentioned, and he explains this by assuming that Winkler employed so much nitrogen tetroxide that it left a large excess beyond that which could combine with the sulphuric acid as nitrous acid : hence the sudden and violent ebullition and liberation of nitrogen tetroxide on heating the mixture.

2 cc. nitrogen tetroxide added to sulphuric acid of 1.805 specific gravity was broken up into practically the same proportions of nitrous and nitric acids as in the first experiment, with acid of 1.84 specific gravity.

Other experiments are described in which sulphuric acid of 1.75 specific gravity was mixed with nitrogen tetroxide and then heated (*a*), so that the vapor evolved might at once escape, and (*b*) where a long tube was attached to the flask in which the mixture was heated, so that the vapor might condense and flow back again to the acid in the flask. In

(a) nitrous acid, but no nitric acid was found, whilst in (b) nitric acid was present but no nitrous acid; this is explained by the fact that it requires concentrated sulphuric acid to combine with and retain the nitrous acid; and in (a) the acid became concentrated by evaporation, whilst in (b) it remained of about the same strength, and was unable to retain the nitrous acid.

Again, when the mixture was heated on a water-bath at about 95° , no such changes occurred.

As Winkler found, that on heating his mixture of acid of 60° B. with nitrogen tetroxide, the latter was evolved, he presumed that it existed as a mechanical mixture with the acid. This the author denies, stating that had Winkler examined the acid after boiling, he would have found that it contained nitric acid, and that the nitrogen tetroxide had really undergone decomposition; and further, that he must have heated it considerably above the temperature of boiling water, otherwise no change would have resulted, and no red fumes would have been liberated.

When the amount of nitrogen tetroxide added is in excess of that required to form nitrosulphuric acid, the author is uncertain from analysis whether it exists in the acid in the form of nitrous acid or of nitrogen tetroxide.—*Ger. Chem. Soc.*, Feb. 1880, p. 91, from *Dingl. polyt. J.*, 233, 155 to 165.

CONTRIBUTION TO THE CHEMISTRY OF GURJUN BALSAM.

BY EDUARD HIRSCHSOHN, MAG. PHARM.

In my work, "Contributions to the Chemistry of the more important Gum Resins, Resins and Balsams,"¹ will be found experiments which were made with a liquid sold as gurjun balsam. The sample I examined did not solidify on heating, showed a slight fluorescence, and did not give with nitric and sulphuric acids the violet coloration mentioned by Flückiger.² As no sample of the balsam described by Flückiger was at my disposal, I was unable at the time to determine

¹"Archiv der Pharmacie," vii, 6, 1877.

²Flückiger proceeded as follows: One drop of the balsam is dissolved in twenty drops of bisulphide of carbon, and one drop of a previously cooled mixture of concentrated sulphuric and nitric acids added and the whole well shaken. "Jahresbericht für Pharmacognosie," etc., 1876, p. 220.

whether any difference, other than the above-mentioned, could be detected between the two specimens by means of the reagents I had employed in the quoted work. Last year Professor Hamberg presented a sample of the balsam to the Museum of the Pharmaceutical Institute of this town, and the experiments made with this specimen, kindly placed at my disposal by Professor Dragendorff, and a sample of gurjun purchased at a neighboring chemist's, yielded the following results:

Both samples showed a strong fluorescence in green, and formed on standing a deposit consisting entirely of crystals, the quantity of which in the last named sample was small in comparison to that received from Professor Hamberg.

On heating in a test tube, the balsam from Professor Hamberg became quite solid, so that the tube could be inverted without any fear of the contents running out, while with the second sample a solidification appeared only after heating for a considerable length of time, and even then it did not become so thick as the first named sample.

Alcohol (95 per cent.) dissolved both samples with the exception of a white residue.

Ether (*pure*) dissolved also incompletely. The cloudy mixture became on the addition of an equal volume of alcohol nearly clear, and the greater part of the deposit was taken into solution.

Ether and Alcohol (equal volumes) gave an opalescent solution.

Chloroform dissolved, forming a clear liquid.

Solution of Bromine (1 part of bromine in 20 parts of chloroform) added to the chloroformic solution of the balsam (3 drops balsam, 1 cc. chloroform and 5 drops bromine solution) produced at first no appreciable alteration, but after a time the mixture became intensely green-colored and retained this color tolerably long.

Bisulphide of Carbon gave a cloudy solution with the balsam and the reagent recommended by Flückiger produced a deep violet coloration, which in Hamberg's sample was permanent for hours, whilst in the second sample it disappeared in the course of a short time.

Alcoholic Solution of Acetate of Lead (a saturated solution of acetate of lead in 95 per cent. alcohol) produced in the filtered alcoholic solution no change.

Alcoholic Solution of Ferric Chloride (10 per cent. in 95 per cent. alcohol) colored the alcoholic solutions of the balsam darker.

Concentrated Sulphuric Acid dissolved the balsams with yellowish-brown color, and this solution with five to ten volumes of water gave a white milk; with three to five volumes of alcohol, a flesh-colored mixture passing into violet.

Alcoholic Hydrochloric Acid (i.e. 95 per cent. alcohol saturated with gaseous HCl.) yielded with the balsam a yellowish-red tincture, which on the addition of alcohol became violet.

Petroleum Spirit dissolved incompletely.

*Chloral Reagent*¹ colored both balsams, as well as the residue left on evaporating the petroleum spirit solution, deep green.

To allow of an easy comparison of the reactions previously, and those now obtained, I have tabulated the results as follows:

	Hamberg's Gurjun Balsam.	Gurjun Balsam, "Archiv d. Pharm.," vii, 6, 1877.
Ether,	Solution incomplete,	Incomplete.
Alcohol,	" "	" "
Ether-Alcohol, . .	" opalescent.	Perfectly clear.
Chloroform, . . .	" clear.	Incomplete.
Solution of Bromine,	Green coloration.	Yellowish coloration.
Chloral Reagent,	Green.	Green.
Flückiger's Reagent,	Violet coloration.	Bright yellow coloration.

As will be seen from the above table the two samples of true balsam now examined differ from the one previously experimented upon: (i) in the Flückiger reaction; (ii) they are completely soluble in chloroform, and (iii) give with solution of bromine a green coloration. The slight difference between Professor Hamberg's sample and that from a chemist in this town is due, I am convinced, to the presence of alcohol in the latter, for if it be freed therefrom by distillation the two give identical reactions.

The true gurjun balsam differs from copaiva balsam:

(i) in the violet coloration produced by Flückiger's reagent in the bisulphide of carbon solution;

(ii) in the incomplete solubility in ether (copaiva balsam gives a clear solution);

(iii) in the negative behavior of acetate of lead to the alcoholic solution. (Copaiva balsam gives a cloudiness which on warming disappears.)—*Pharm. Jour. and Trans.*, Jan., 1880, p. 561 and 606.

¹ "Archiv der Pharmacie," vii, 6, 1877.

THE TESTING OF PEPSIN.

BY A. PETIT.

Recent investigation having directed attention to the ferments which preside over the transformation of the various alimentary matters, it appeared to me that it would be useful to define the present state of this interesting question, and particularly to state the method of testing most convenient to be adopted for these ferments, of which the medical employment is becoming more and more common.

In commencing this study I would recall that all the facts relative to the action of pepsin and diastase have been explained with the greatest clearness by M. Mialhe. Upon reperusing the memoirs of 1845 and 1846 it will be seen that his opinions, sharply discussed at the time when they appeared, are now accepted by all investigators occupied with the phenomena of digestion. On the present occasion I will deal only with certain facts connected with the transformation of nitrogenous foods by pepsin.

These substances—albumen, fibrin, casein, etc.—submitted to the combined action of pepsin and an acid, are transformed at first into a compound, named caseiform albumen by M. Mialhe, and more recently syntonin; then into another substance—the ultimate product of the stomachic digestion of albuminoid matters—the albuminose of Mialhe, or the peptone of Lehmann. According to their source, these peptones, although they are very probably isomers, differ from one another by their action upon polarized light.

M. Henninger thinks that the peptones are formed by the hydration of albuminoid matters, and as they combine indifferently with acids and bases he considers them as weak acid amides. M. Meissner divided the products of transformation of albuminoid matters into parapeptones, metapeptones, dyspeptones and peptones α , β and γ ; but these divisions can no longer be accepted in the present state of science.

The essential characters of peptones are those of not being precipitated by saturation of the acid liquids holding them in solution, or by nitric acid, or by ferrocyanide of potassium added to acetic acid. They are mostly soluble in water, even after having been precipitated from their aqueous solution by excess of alcohol.

The test by nitric acid has a prime importance, as will appear subsequently. It permits, in fact, of ascertaining rapidly whether the transformation is more or less advanced. When nitric acid, added drop

by drop, to a peptic solution of albumen no longer gives a precipitate it may be concluded that all the albumen is transformed into peptones.

The report upon pepsin presented in 1865 by M. Guibourt to the Société de Pharmacie, did not sufficiently bring out the importance of this reaction. M. Guibourt thought that the solution of the fibrin was sufficient, and it appears (p. 102) that 1 gram of pepsin prepared by the Commission, in presence of 8.40 grams of lactic acid and 20 grams of water, very incompletely modified 12 grams of fibrin after heating for twelve hours at 40 to 45°C. The solution was in fact semigelatinous, and was strongly precipitated by nitric acid. Certainly, at the present time, such a pepsin would be considered to be of mediocre quality.

Rapid solution indicates that the pepsin is of good quality, but between this phenomenon and that of transformation the difference is essential.

Let us now examine the various methods of testing that have been proposed for pepsin, and see which is most suitable for adoption.

1. *Test by Coagulation of Milk.*—This process ought to be rejected. M. Guibourt had, in 1865, come to the conclusion from experiments made on rennet, that the principle in rennet, which produces the coagulation of milk, is not that which dissolves and transforms fibrin. I have observed also that a pepsin, twelve times more active than another prepared from calves' rennet, was much less active than the latter in respect to the coagulation of milk. It is probable that this special action is due to a particular ferment.

2. *Test by Coagulated White of Egg.*—This test is universally adopted in England and in Germany. I have made some experiments to determine:

(a) The temperature most favorable to solution.

(b) The action of various acids.

(c) The acidimetric strength which it is advisable to give to the liquors.

With respect to temperature, experiments were made at from 30° to 80°C. Even at elevated temperatures the action of acidified pepsin is produced, but the maximum occurs at 50°.

With liquors containing 2 to 15 per mille of acetic or butyric acid, I have been able to convince myself that in the presence of these acids pepsin is without action upon coagulated white of egg. Tartaric, lactic, and especially hydrochloric acids, on the contrary, facilitate the action of pepsin.

The solution of tartaric acid ought to be of the strength of about 10

grams, and that of lactic acid from 8 to 12 grams per liter. With hydrochloric acid, the digestion of white of egg takes place very well in liquors containing from 1 to 3 parts per 1,000 of real acid, the most favorable acidity being $1\frac{1}{2}$ part per 1000.

In the study of similar phenomena it ought never to be forgotten that the digestion in the stomach goes on at a temperature of about 40°C . It is, therefore, especially at this temperature that the test of artificial digestions should be made. It might happen, in fact, that an acid solution, acting on albumen at 50° or 60°C ., would be less active at 40°C . This is what takes place with lactic acid, which at a concentration corresponding to 2 or even 3 per 1,000 of real hydrochloric acid leaves white of egg in great part undissolved at a temperature of 40°C ., whilst hydrochloric acid of 1 per 1,000, in the same conditions of time and temperature, dissolves and transforms all the albumen.

In these facts is found the experimental demonstration that the free acid of the gastric juice is hydrochloric acid. This is a fact, moreover, gained to science by the remarkable researches of M. Richet, who has proved that the acidity of the gastric juice is about 2 per 1,000; that it is due solely to hydrochloric acid, and that if lactic acid is found there it is the product of a special fermentation which the food has undergone in the stomach.

The more that artificial digestions are studied the more evident becomes the similarity which exists between these phenomena and those of the stomachal digestion. No doubt, the stomach absorbs during the digestive period a portion of the liquids and of the peptones they contain, and this, according to Schiff, favors digestion considerably. The movements in the food which this initiates facilitate the action of the gastric juice, the secretion of which is uninterrupted; but it is no less true that in experiments *in vitro* it is easy to equal and even to surpass the digestive power of the stomach.

We know that the activity of the gastric juice is always maintained within certain limits, the secretions of the stomach rapidly re-establishing an equilibrium when this is more or less destroyed. The specific action recognized in hydrochloric acid throws light on the rationale of certain medicines and the troublesome influence exercised by some substances upon the act of digestion. As has been justly remarked by M. Richet, in the case of abnormal fermentations there is produced a great excess of lactic, acetic and butyric acids. Hydrochloric acid is no longer secreted, but instead, a less active acid, lactic acid, or inactive

acids, acetic and butyric. The utility will hence be understood of employing in such a case alkalies, which in saturating the free acids induce a fresh secretion of hydrochloric acid and thus restore to the gastric juice all its digestive power. It will be understood also that to attain the same object sometimes solutions of hydrochloric acid and sometimes of the alkaline bicarbonates have been given with success. It is necessary, besides, in this case, that the acetates and butyrates should be eliminated by stomachal absorption; otherwise they would be decomposed and the inactive acids again set free by the hydrochloric acid secreted normally or administered as medicine.

To return to the testing of pepsin by coagulated white of egg, one objection that may be brought against it is that it does not establish a sufficient gradation in the transformations. However this may be, the method of operating is as follows:

An egg is kept in boiling water during half an hour, and the very coherent white is then passed through a moderately fine strainer. 5 grams of this coagulated albumen, put into contact at 40°C. with 25 grams of hydrochloric acid containing 1.50 of HCl per liter, ought to be dissolved in four to five hours by 0.10 gram of pepsin of good quality. It is necessary to agitate the flask every half hour.

Test by Fibrin.—This appears to me to present great advantages over the preceding. The phenomena are very distinct and very comparable. Whatever may be the origin of a ferment, in the same conditions of time, temperature and acidity of the menstruum, its exact equivalence can be determined by relation to other specimens. The following are the conclusions I have arrived at with respect to the best conditions for the transformation of fibrin.

The temperature of 50°C. is that of the maximum. The same pepsin is about four times less active at 40° than at 50°C.

The acid most favorable to the transformation is hydrochloric acid. In order to approach the action of this acid it is necessary to employ relatively large quantities of lactic or tartaric acids, about 25 to 30 grams per liter. With lactic acid in the proportion of 20 grams per liter the action is five times less than that which corresponds to a 3 per 1,000 solution of hydrochloric acid. With hydrochloric acid the most favorable action is obtained with a solution containing between 2 and 5 grams of real HCl per liter.

To recapitulate, it appears that the acidity of the gastric juice does not exceed 2 to 3 grams per liter of acid expressed as HCl, which

would give 5 to 7.5 grams of acid expressed as lactic acid, whilst the action would be much weaker in the presence of the latter solvent.

I would also remark that the acidity of the 1 per 1,000 in HCl, which is favorable to the solution of coagulated albumen, is not sufficient for the easy transformation of fibrin. In order to approach physiological condition I would propose, therefore, to employ 1.50 gram of real HCl per liter in the testing with coagulated white of egg and 3 grams per 1,000 for testing with fibrin.

It may be asked whether it is not possible to render the testing of pepsin more practical by diminishing the time of operating. Nothing is more easy. In heating during six hours instead of twelve about twice as much pepsin is required for the transformation. Again, in heating during six hours at 40°C., instead of twelve hours at 50°C., nearly eight times the quantity of pepsin is required to obtain the same result.

This great influence exercised by temperature renders it necessary that a standard for operating should be fixed in an exact manner. The Commission of 1865, in recommending to heat to from 40° to 45°, was not sufficiently precise upon this important point.

I have stated that there is an essential difference between the solution of fibrin and its transformation; the following experiments demonstrate this very clearly:

A pepsin prepared in my laboratory, which dissolved and transformed in twelve hours at a temperature of 50°C. six hundred times its weight of fibrin in a liquor containing 4 per 1,000 of real HCl, dissolved in the same conditions:

1,200 times its weight of fibrin in	.	.	.	1 hour.
2,400 " " "	.	.	.	1 hour 10 minutes.
4,800 " " "	.	.	.	1 hour 15 minutes.
9,600 " " "	.	.	.	1 hour 45 minutes.
19,200 " " "	.	.	.	2 hours 10 minutes.

It was not thought necessary to carry the experiment further.

An identical experiment was made with lactic acid in the proportion of 0.40 gram to 25 cc. or 16 grams per liter. Although the same pepsin transformed in these conditions only one hundred times its weight of fibrin, instead of six hundred times, as in the preceding experiment, it was found that it dissolved—

1,200 times its weight in	.	.	.	30 minutes.
2,400 " " "	.	.	.	1 hour 15 minutes.
4,800 " " "	.	.	.	1 hour 30 minutes.
9,600 " " "	.	.	.	4 hours.
19,200 " " "	.	.	.	5 hours.

It is necessary to add that in flasks differing from the others only in the absence of pepsin no liquefaction took place.

To test a pepsin, therefore, I should take of hydrochloric acid of the strength of 3 grams of HCl per liter 25 cc.; then 5 grams of moist fibrin strongly dried, and add to several flasks so prepared quantities of pepsin ranging from 0.10 to 0.60 gram. These should be heated to 50°C., for it has been seen that four times as much pepsin would be required at 40°C., which would be an useless waste. Agitate every half hour until the complete solution of the fibrin, and then every hour.

A good pepsin ought not to give a precipitate with nitric acid after twelve hours' heating in flasks containing 25 to 30 centigrams, and after six hours in those containing 50 to 60 centigrams. The nitric acid should be added drop by drop to 10 cc., for example, of the solution, and not the slightest turbidity should be produced in the liquor at the moment of adding it.

In these experiments I have for some time used a fibrin of mutton washed until it has become white and preserved in pure glycerin. When required for use it is washed with plenty of water.

In subsequent communications I shall show the action which a number of bodies exercise upon the peptic and diastatic ferments.—*Pharm. Jour. and Trans.*, Jan. 24, 1880, from *Jour. de Pharm. et de Chimie*, 5th ser., vol. i, p. 82.

ANTIDOTES.

By Dr. TH. SCHLOSSER.

Translated from "Ztschr. d. Allg. Oest. Apoth. Ver.," 1880, Nos. 1 and 2, by
LOUIS VON COTZHAUSEN, PH.G.

In order to supply the demand for a reliable table of antidotes the author publishes the following, and at the same requests others to assist in improving and completing the formulas.

General Remark.—An emetic is unnecessary when the poisoned patient has already vomited freely.

Antidotes for :

1. <i>Aconitia.</i>				Then :			
R	Cupri sulph.,	.	1.0	R	Acid. tann.,	.	4.0
	Aquæ dest.,	.	40.0		Aquæ dest.,	.	200.0
	Dissolve.				Syr. simpl.,	.	50.0
S : Emetic; give half, and balance, if necessary, in five minutes.				M. S : Tablespoonful every five minutes.			

2. *Excessive Etherization.*

R Aquæ ammon., . . . gtt. 15
Aquæ dest., . . . 20°0
S : To be taken at one dose.

R Aquæ ammoniæ, . . . 30°0
S : For smelling. (Cold water must be freely applied and fresh air.)

3. *Caustic Alkalies and Alkali Carbonates.*

R Acidi tartaric., . . . 10°0
Aquæ font., . . . 1000°0

M. S : Drink a tumblerful at once ; then every five minutes a dessertspoonful of almond oil, with five tablespoonfuls of the tartaric acid solution. (This is sufficient for 100 grams of a 5 per cent. solution of alkali.)

4. *Caustic Lime and Calcium Salts.*

R Magnes. sulph., . . . 20°0
Aquæ dest., . . . 100°0
Syr. simpl., . . . 40°0
Dissolve.

S. : Take at once.

Then :

R Ol. amygd. dulc., . . . 20°0
Pulv. gum. acaciæ, . . . 10°0
Aquæ dest., . . . 15°0
Syr. simpl., . . . 100°0

M. D. S. : Two dessertspoonfuls every quarter hour.

5. *Alcohol Intoxication.*

R Pepsini, . . . 2°0
Aquæ dest., . . . 200°0
Acid. mur., . . . 1°00

M. D. S. : Tablespoonful every five minutes.

Or

R Aquæ ammon., . . . gtt. 10
Aquæ dest., . . . 150°0
Syr. simpl., . . . 20°0

M. S. : Take at once.

6. *Ammonia.*

R Acid. acet. concent., . . . 10°0
S. : For smelling.

R Acet. crud., . . . 20°0
Aquæ dest., . . . 200°0
Syr. simp., . . . 20°0

M. S. : Tablespoonful every five minutes.

R Aceti crudi, . . . 50°0
Aquæ dest., . . . 200°0
S. : Inhale warm. (Cold washing.)

7. *Anilin Preparations.*

R Cupri sulph., . . . 1°0
Aquæ dest., . . . 40°0

S. : Emetic ; half to be taken at once, and the other half in five minutes, if necessary.

R Magn. ust. in aq., . . . 200°0
D. S. : Tablespoonful every half hour.

8. *Antimonial Preparations and Tartar Emetic.*

R Acid. tannic., . . . 3°0
Aquæ dest., . . . 140°0
Syr. althææ, . . . 60°0

M. S. : Tablespoonful every five minutes.

9. *Arsenic Preparations.*

R Magn. ust. in aq., . . . 200°0

D. S. : One-third to be taken at once, then a tablespoonful every five minutes.

10. *Atropia.*

R Fol. jaborandi, . . . 10°0
Fiat infus. ad colat. . . 200°0

S. : Take half at once, then every half hour a tablespoonful with a table-spoonful of wine.

R Pilocarpin. mur., . . . 0°05
Aquæ dest., . . . 2°00

S. : Inject hypodermically.

11. *Baryta.*

Treat like lead salts.

12. *Belladonna.*

Treat like atropia.

13. Bites by Dogs and Cats.

R Potassæ, 1'0
 Aquæ dest., 500'0

M. S.: Wash the wound, and keep open with linen dipped into it, until a physician arrives.

14. Snake Bite.

See dog bite.

R Aquæ ammon., gtt. 30
 Aquæ dest., 150'0
 Syr. simp., 30'0

M. S.: Tablespoonful every five minutes.

15. Lead Salts.

R Aquæ laxat., 50'0
 Magnes. sulph., 30'0
 Aquæ ferv., 100'0

M. S.: Give in two doses, within ten minutes.

Bromine.

R Magn. ust. in aqua, 200'0

S.: Take one-third at once, then a tablespoonful every quarter of an hour.

17. *Brucia*.

Treat like strychnia

18. *Cannabis Indica*.

Treat like morphia.

19. *Cantharidin*.

R Cupri sulph., 1'0
 Aquæ dest., 40'0

M. S.: Emetic; take one-half immediately, and the balance in five minutes, if necessary.

Then:

R Camph., 3'0
 Muc. g. arabic, q. s.
 Mixt. gummos., 300'0
 Tr. opii, gtt. 10

M. S.: Tablespoonful every five to ten minutes.

20. *Carbolic Acid*.

Use the same emetic as for anilin.

Then:

R Magn. ust. in aqua, 200 0

S.: Take one-half at once, then every quarter of an hour a tablespoonful alternately with

Mixt. oleos., 200'0

S.: Tablespoonful every quarter of an hour.

21. *Chloral Hydrate*.

R Atrop. sulph., milligram. 2
 Aquæ dest., 35'0

M. S.: Give in two doses, in the course of half an hour. (Instead of atropia tincture of belladonna, 2'0 may be given in the same manner.)

22. *Chloroform*.

R Aquæ ammon., 50 0

S.: For smelling. (Cold douche and ice applied to the head.)

R Two Seidlitz powders.

S.: Give one.

If very bad, give

R Cupr. sulph., 1'0
 Aquæ dest., 40'0

S.: Emetic; give one-half, and, if necessary, the other half five minutes later.

23. *Chlorine Vapors*.

R Aquæ laurocerasi, 10 0
 Aetheris,
 Alcohol, 90 per cent, āā 30'0

S.: For smelling and inhaling.

R Spir. nitr. dulc., 20'0
 Syr. althææ,
 Aquæ dest., āā 40'0

M. S.: A tablespoonful every five or ten minutes.

24. *Chromic Acid and Chromates*.

R Pulv. ferri, 5'0
 Linct. oleos.,
 Syr. simp., āā 50'0

M. S.: Shake well, and take a dessert-spoonful every five minutes, and then two tablespoonfuls of water.

25. *Sulphuretted Hydrogen.*

R Spir. ætheris comp., . . . 30'0
S.: Give ten drops every five minutes
in a dessertspoonful of water.

R Spir. æth. nitrosi, . . . 50'0
S.: Pour on a cloth, and apply to
nostrils.

R Calc. hypochlor, . . . 40'0
S.: For smelling. (Fresh air; wash
with vinegar.)

26. *Codeia.*

See morphia.

27. *Colchicia.*

See aconitia.

28. *Conia.*

R Strych. nitr., . . . 0'01
Aquæ dest., . . . 100'0
Tr. opii, . . . gtt. 30

M. S.: Two dessertspoonfuls every
quarter of an hour, until one-third is
taken; then every half hour, until the
second one-third is consumed; then
every hour.

29. *Curare.*

R Strychn. nitr., . . . 0'05
Aquæ dest., . . . 5'0
M. S.: Inject.

30. *Potassium Cyanide and Prussic Acid.*

R Cupri sulph., . . . 2'0
Aquæ dest., . . . 28'0
Dissolve.

S.: Emetic; Tablespoonful at once,
the balance in five minutes. (Cold wa-
ter ought to be applied.)

31. *Digitalis.*

Like morphia.

32. *Muscarin.*

See chloral hydrate.

Or

R Atrop. sulph., . . . 0'01
Aquæ dest., . . . 5'0
S.: Use as an injection.

33. *Gratiola.*

Like aconitia.

34. *Helleborus.*

See aconitia.

35. *Hyoscyamus.*

See morphia.

36. *Stings by Insects.*

R Aquæ ammon., . . . 20'0
S.: Apply externally.

37. *Iodine.*

R Amyl., . . . 5'0
Mix by triturating with a little
water; then pour on
Aquæ fervidæ, . . . 100'0
and add
Magn. ust. in aqua, . . . 100'0
S.: Tablespoonful every five minutes.

38. *Lime.*

See caustic lime.

39. *Oxalic Acid and Oxalates.*

R Calcii carb. pulv., . . . 50'0
Aquæ dest., . . . 200'0
M. D. S.: One-half at once; then
every ten minutes a tablespoonful. Half
an hour later take
R Aquæ laxat. Vienn., . . . 50'0
Sodii sulph. cryst., . . . 10'0
Dissolve
S.: Take at once.

40. *Carbonic Oxide and Carbonic Acid Gas.*

R Aquæ ammon., . . . 40'0
S.: For smelling. (Cold ablutions.)
R Extr. ergotæ, . . . 0'30
Aquæ dest., . . . 50'0
S. S.: Dessertspoonful every quarter
of an hour.

41. *Creasote.*

R Pulv. acaciæ, . . . 10'0
Ol. amygd. dulc., . . . 20'0
Aquæ dest., . . . 280'0
Ft. emulsio.
D. S.: Take one-fourth at once, then
half a teacupful every ten minutes.

42. *Copper Salts.*

R	Pulv. ferri,	14°0
	Flor. sulph. lot, . . .	8°0
	Syr. simpl.,	60°0

M. D. S.: Shake well, and give a dessertspoonful every five minutes, alternating with

R	Magn. ust. in aq., . . .	200°0
	Mix with white of 4 eggs and add	
	Aquæ dest.,	200°0
	Syr. simpl.,	80°0

S.: Half a teacupful every five minutes.

43. *Swallowed Copper Money.*

To children:

R	Hydrom. infant., . . .	20°0
	D. S.: Give at once.	

To adults:

R	Aq. laxat. Vienn., . . .	50°0
	Sodii sulph. cryst., . .	10°0
	D. S.: Take at once.	

44. *Lactucarium.*

As morphia.

45. *Mineral Acids.*

R	Magn. ust. in aq., . . .	200°0
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D. S.: Take one-half at once; then a tablespoonful every five minutes, alternating with two tablespoonfuls of the following:

R	Ol. amygd. dulc., . . .	20°0
	Pulv. acaciæ,	10°0
	Aquæ dest.,	200°0
	Syr. simp.,	100°0

Fiat emuls.

46. *Morphia.*

R	Cupri sulph.,	1°0
	Aquæ dest.,	40°0

M. D. S.: Emetic; give one-half and, if necessary, the balance in five minutes.

Besides:

R	Coffeæ tostæ,	50°0
	F. infusum ad colatur., .	200°0
	Acidi tannici,	4°0
	Syr. simpl.,	50°0

S.: Teaspoonful every five minutes.

47. *Nicotina.*

In case of nausea in consequence of smoking.

R	Aceti crudi,	50°0
	Aquæ dest.,	200°0
	Syr. simpl.,	50°0

M. S.: One-half at once, and then a tablespoonful every five minutes.

In case of poisoning.

See morphia.

R	Acidi tannici,	4°0
	Aquæ dest.,	200°0
	Syr. simpl.,	50°0

M. D. S.: Tablespoonful every five minutes.

48. *Opium.*

Treat like morphia.

49. *Paris quadrifolia.*

Like morphia.

50. *Phosphorus.*

R	Cupri sulph.,	1°0
	Aquæ dest.,	40°0

Solve.

D. S.: Emetic; Give one-half, and, if necessary, the balance in five minutes.

Then:

R	Ol. terebinth. vetusti, . .	30°0
	(the older the better), beat with	
	the white of 2 eggs, and add	
	Aquæ menth. pip., . . .	250°0
	Syr. simpl.,	50°0

Fiat emulsio.

S.: Shake well, and give one tablespoonful every half hour, until one-fourth of the mixture has been given; then one tablespoonful every hour.

In doubtful cases of poisoning with phosphorus give

R	Magn. ust. in aqua, . . .	20°0
	Aquæ chlori,	120°0

M. D.

51. *Phosphorus—Burns.*

R	Argenti nitr. fus., . . .	2°0
	Aquæ dest.,	20°0

Solve.

S.: Apply with a camel-hair brush, and use as a wash.

52. *Pulsatilla*.

Treat like aconitia.

53. *Mercury Salts*.

See copper salts.

54. *Sabina*.

See morphia.

55. *Santonin*.

R Cupri sulph., . . . 1'0
Aqua dest., . . . 40'0

S.: Emetic; give one-half at once, and, if necessary, the balance in five minutes.

56. *Fungi*.

Like morphia.

57. *Ergot*.

Like sausage poison.

58. *Silver Preparations*.

R Sodii chlorid., . . . 20'0
Aqua comm., . . . 300'0

M. D. S.: Give one-half at once, and then a tablespoonful every half hour.

Between the doses give:

R Mixturæ oleosæ, . . .
Mixturæ gummosæ, . . . 150'0

M. S.: Two tablespoonfuls every half hour.

59. *Stramonium*.

Like opium.

Then:

R Morph. mur., . . . 0'10
Aqua dest., . . . 10'0

Inject hypodermically.

60. *Strychnia*.

R Acidi tannici, . . . 3'0
Aqua dest., . . . 140'0
Syr. althææ, . . . 60'0

M. D. S.: Tablespoonful every five minutes.

R Chloral. hydrat., . . . 4'0
Aqua dest., . . . 100'0
Solve.

S.: Tablespoonful every half hour.

61. *Veratria*.

Treat like morphia.

62. *Sausage Poison, or Spoiled Meat*.

R Cupri sulph., . . . 1'0
Aqua dest., . . . 40'0

S. D. S.: Emetic; give one-half at once, and, if necessary, the balance in five minutes.

Then give:

R Aetheris pur., . . . 2'0
Aqua dest., . . . 150'0
Tr. opii, . . . gtt. 10
Syr. capill. vener., . . . 20'0

S.: Tablespoonful every half hour.

63. *Zinc Salts*.

R Acidi tannici, . . . 4'0
Aqua dest., . . . 140'0
Syr. althææ, . . . 60'0

D. S.: Tablespoonful every five minutes.

64. *Tin Salts*.

R Pulv. ipecac., . . . 2'0
Aqua dest., . . . 100'0
Syr. simpl., . . . 20'0

M. D. S.: Emetic; to be taken in two doses inside of quarter of an hour.

Then:

R Magn. ust. in aqua, . . . 200'0

S.: Take one-third at once, then a tablespoonful every five minutes, besides plenty of milk.

65. *Petroleum, or Volatile Oils*.

R Mixt. oleos., . . . 1000'0
S.: Drink continually.

NOTE.—The following are the formulas of several of the preparations ordered above:

Aqua laxativa Viennensis.

Nearly identical with Infus. Sennæ comp., Ph Germ.

R	Senna,	.	.	.	6 p.
	Hot water,	.	.	.	48
	Infuse, for half an hour, strain and add				
	Manna,	.	.	.	8 p.

Hydromel infantum.

R	Vienna draught,	.	.	3 p.
	Syrup of manna,	.	.	1

Linctus oleosus.

R	Acaciæ pulv.,	.	.	1 p.
	Aquæ amygd. amar. dil.,	.	.	
	Ol. amygd. expres.,	.	aa	2
	Syr. althææ,	.	.	3
	M.			

Magnesia usta in aqua.

R	Magnesia,	.	.	1 p.
	Water,	.	.	6

VARIETIES.

Wickersheimer's Preserving Fluid.—As originally published by the Prussian Government (see "Amer. Jour. Phar.," 1880, p. 102), the formula is incorrect in giving 10 grams of arsenious acid; the quantity should be 20 grams. (*Phar. Zeitung*, 1879, p. 105.)

J. Martenson ("Phar. Zeitschr. f. Russland") directs attention to the reaction between the alum and the potassium carbonate in the original formula, resulting in the formation of potassium sulphate and rendering tedious filtration necessary, and suggests the following improved formula, in which the alum is partly replaced by borax: Dissolve arsenious acid 20 parts, potassium carbonate 90 parts, sodium nitrate 30 parts, sodium chloride 50 parts, potassium sulphate 40 parts, and borax 100 parts in 6,200 parts of water, and add glycerin 3,000 parts and 90 per cent. alcohol (or methylic alcohol) 500 parts. The arsenious acid and potassium carbonate should be dissolved separately by boiling with a small quantity of the water.

In the hospitals of St. Petersburg, Dr. Sesemann employs a preserving fluid consisting of arsenious acid 10 parts, crystallized carbonate of sodium 20 parts, water 350 parts, and glycerin 650 parts.

A new Method of Administering Koosso.—Of all the remedies for tape-worm none is more certain or efficient than koosso, and many efforts have been made to bring it into such pharmaceutical shape that, while its properties as a tenicide remain unimpaired, it might be administered without repugnance. Dr. Corre, some years ago, proposed the following method, which has been successfully used in many cases: One-half ounce of fresh powdered koosso is treated with 1 ounce of hot castor oil, and afterward with 2 ounces of boiling water by displacement; express, and by means of the yolk of an egg combine the two percolates into an emulsion, and add 40 drops of sulphuric ether, flavoring with some aromatic oil.

This is to be taken at one dose early in the morning, after a previous fast of about 18 hours. The worm is usually expelled dead after 6 or 8 hours.—*Buffalo Med. and Surg. Jour.*, January.

A New Remedy.—With the coming summer we are threatened with the introduction of a new remedy, for which is claimed a wonderful efficacy in cystic and nephritic affections. The *stigmata of maize*, or “corn-silk,” is the substance which, for our sins, is to be added to the list of new drugs already unconscionably longer than the list of benefits derived from their use. The mode of administration of the maize stigmata is to be the extract or syrup, the decoction being “unreliable.” The results already obtained with the drug are rapid suppression of the painful symptoms of vesical catarrh and chronic cystitis. In cystitis subsequent to gonorrhœa, or when traumatic in origin, though the medicine produces marked diuresis, it excites increased pain. It may possibly be that the stigmata of maize do contain a product that will prove of therapeutic value, but the experience of recent so-called “new remedies” is not encouraging to the hopeful.—*Med. Press and Circular*, Jan. 14.

Senecio Aureus in Rheumatism.—For removing the rheumatic diathesis, Dr. N. S. Davis (Chicago “Med. Journ. and Exam.,” Sept.) extols the life-root plant, *Senecio aureus*. In a typical case of chronic rheumatic carditis he perscribes:

R	Acid carbolie (crystal),	.	.	.	0.40 gram.
	Glycerin (pure),	.	.	.	16.00
	Tinct. gelsemium,	.	.	.	16.00
	Tinct. digitalis,	.	.	.	32.00
	Fl. ext. senecio aureus,	.	.	.	96.00 M.

SIG.—Give 5 grams, or an ordinary teaspoonful, in a little water, just before each meal and at bed-time.

The steady use of this, with due attention to diet and exercise, and the avoidance of all use of alcoholic drinks and tobacco, will probably do as much to counteract the rheumatic diathesis, regulate the action of the heart, improve digestion, and thereby prolong the life and usefulness of the patient, as any course of treatment we could suggest.—*Med. and Surg. Rep.*, November.

Formiate of Sodium as a Defervescent.—M. Arloing, of Paris, recently reported to the Academy of Medicine some experiments with this salt, showing that it lowers the animal temperature in a marked manner. It is poisonous when the dose exceeds 1 gram to the kilogram of the living weight of the animal. The effects he describes assign to formiate of sodium a place among defervescent remedies. This compound is therefore pointed out by M. Arloing to the attention of physicians, who might employ it in a certain number of cases where the action of salicylate of sodium is feared, for the formiate does not congest the kidneys like the salicylate, and does not modify the heat so profoundly as this latter substance.—*Ibid.*, Jan. 10.

Administration of Creasote.—Reuss prepares capsules, each containing 5 centigrams of creasote, combined with balsam of tolu as an excipient, for which purpose the balsam is admirably adapted.—*Archivio di Farmacia*, 1880, p. 37.

Protagon, discovered by Liebreich in the brain substance (“Annalen,” 134, p. 24 to 44), has been regarded by some authors as a mixture of lecithin and cerebrin. A. Gamgee and E. Blankenhorn (“Ber. d. Chem. Ges.,” 1879, p. 1229 to 1234) con-

sider this view untenable, and have prepared large quantities of protagon from the brain of oxen, horses and dogs by a modification of Liebreich's process. Its formula appears to be $C_{160}H_{308}N_5PO_{35}$. It is a white body, permanent in the air, crystallizing when heated with alcohol to $45^{\circ}C$., turning brown at $150^{\circ}C$. and melting at about $200^{\circ}C$. to a brown syrup. On being continuously boiled with ether it is decomposed.

The chemical constitution of Cerebrin, freed from lecithin and cholesterin, and crystallized from alcohol, was studied by Geoghegan, who found as the average result of different analyses: 68.7 per cent. C, 10.9 per cent. H and 1.5 per cent. N. By the action of concentrated sulphuric acid on cerebrin a substance melting at 62 to 65° , and containing no nitrogen, was obtained, which the author calls *Cetylid*, $C_{22}H_{42}O_5$. This is insoluble in water, very soluble in ether, chloroform and hot alcohol, and is transformed into palmitic acid, liberating hydrogen and marsh gas, by the action of melting caustic potassa. The yield of cetylid amounts to about 85 per cent. of the cerebrin. As another result of the action of sulphuric acid on cerebrin, an acid is obtained which is soluble in water, reduces alkaline copper solution and rotates the plane of polarized light towards the left.—*Ber. d. Deutsch. Chem. Ges.*, xii, 1879, p. 2250, from *Ztschr. f. Phys. Chem.*

Chaulmoogra Oil.—John Moss found it to be a mixture of the glyceryl compounds of about 2.3 per cent. cocinic acid, 4 per cent. hypogæic acid, 63 per cent. palmitic acid and 11.7 per cent. gynocardic acid, the two last acids being partly present in the free state. Gynocardic acid has probably the formula $C_{14}H_{24}O_2$, is of a pale yellow color, crystalline, produces the acrid burning taste, which is noticed when chaulmoogra is swallowed, and gives a splendid green color with sulphuric acid.—*Phar. Jour. and Trans.*, Sept. 27, 1879.

Porpoise oil is manufactured largely in Provincetown, Mass. Since about the year 1816 it was obtained from the porpoise, the best being derived from the jawbone; it is admirably adapted for oiling watches, clocks, philosophical apparatus, etc. Since 1829 the black fish has also been used for producing this oil, a superior lubricating oil being obtained from the melon, which is taken from the top of the head, reaching from the spout-hole to the end of the nose and down to the upper jaw, and when taken off in one piece has the shape of a half watermelon, weighs about 25 pounds and yields about 6 quarts of oil. After it has been refined it will become somewhat milky at zero, but will not congeal.

The oil from the melon of the cowfish or grampus is of a very yellow color, and when refined by chilling and straining appears to have valuable lubricating properties.—*Scient. Amer.*, Feb. 21.

Porpoise oil is beginning to form an article of export from Trebizond, in Asia Minor. The porpoises are caught in nets and are also shot by expert marksmen. As much as 300 pounds of oil is occasionally obtained from a single animal, and, in spite of its strong smell, it was generally used for lamps before the introduction of petroleum.—*Jour. Appl. Science*, February.

The origin of balsamum antarthriticum indicum (see "Amer. Jour. Phar.," 1878, p. 475) is referred by Dr. Mathes to *Eperua falcata*, a tree of French Guiana.

na. The author also confirms the observations of Dr. Hoelder as to the value of the balsam in rheumatism.—*Memorabilien*, 1879.

Glycyrrhizin is believed, by F. Sestini, to exist in liquorice root in combination with bases, chiefly lime. It is best prepared by exhausting the root with boiling water and a little lime, concentrating the decoction and precipitating with acetic acid. The brownish gelatinous precipitate is washed with water, dissolved in spirit of 50 per cent., the solution decolorized by animal charcoal and evaporated until the alcohol is expelled. The gelatinous mass is dissolved in alcohol, the solution mixed with twice its volume of ether, filtered, evaporated and the residue dried over sulphuric acid. Fresh root, containing 48 per cent. of water, yields 3.271 per cent. of glycyrrhizin, or 6.318 on the dry root.—*Jour. Chem. Soc.*, Sept., 1879.

Oil of Rosemary consists, according to Bruylants, of about 80 per cent. of a laevogyrate hydrocarbon, $C_{10}H_{16}$, boiling near $160^{\circ}C$.; 6 to 8 per cent. of camphor, $C_{10}H_{16}O$, melting at 176° and boiling at $204^{\circ}C$.; and of 4 to 5 per cent. of a borneol camphor, $C_{10}H_{18}O$. With concentrated sulphuric acid a mixture of cymene and terpine is obtained.—*Ibid*.

For burns and scalds, the "Allg. Hopfen-Zeitung" says, one of the best but least known agents is oil of peppermint. Applied by pencil or cloth to the wound, it gives prompt ease from pain and leads to a rapid cure without scars. This oil should always be kept on hand. Previous to its application the burnt part may be kept under water. It is sometimes advisable to dilute it one-half with glycerin. In this form it is an excellent application to frozen extremities.—*Allgemeine Wiener Zeitung*, No. 1, 1880, from *Cinci. Lanc. and Clinic*, Feb. 14.

Menthol, an Anti-Neuralgic.—Mr. A. D. Macdonald, writing in the "Edinburgh Medical Journal," September, 1879, extols the virtues of this substance, which is a volatile solid obtained from Chinese or American oil of peppermint, as a remedy in the various forms of neuralgia. The solution he uses is the following: Menthol gr. i; spt. vin. rect. \mathfrak{M} i; ol. caryoph. \mathfrak{M} x: mix. To be shaken, and painted over the affected tract. Pain is in this way relieved in from two to four minutes, and within a minute or two more the attack ceases. In toothache the author has cleaned out the cavity of the tooth with a little cotton wool, and then placed a single crystal on another small piece of wool and inserted it, with the result that the pain instantly disappeared. A tincture of strength 1:50 is equally effective. Mr. Macdonald recommends menthol as a suitable external application in sciatica, intercostal neuralgia and brachialgia.—*Phila. Med. Times*, Jan. 3.

Alcohol and Chlorinated Lime.—One part of absolute alcohol and 4 or 5 parts of chlorinated lime form a mixture which becomes spontaneously heated in about 10 minutes, when aldehyd, acetal derivatives, alcohol and a greenish-yellow oil, probably ethyl-hypochlorite, distil over. The latter compound is rapidly decomposed, yielding, among other products, a heavy oil, insoluble in water, from which, on fractional distillation, are obtained various chlorinated compounds boiling below

77°C; also mono- and di-chloroacetal, and a compound, probably a chlorinated ethyl-methylic ether, which boils between 77° and 78°C.—*Jour. Prak. Chem.*, xix, p. 393.

The Bichloride of Ethidene as an Anæsthetic.—Dr. J. H. Palmer, of Birmingham, writes to the "*Lancet*," October 25, of this substance:

"I have administered this drug in half a dozen cases, and so far I have met with favorable results. Unconsciousness is produced, so far as my experience goes, with very little struggling, and $4\frac{3}{4}$ minutes was the longest time required. The pulse is slowed, but remains full, and I have not yet met with any symptoms of cardiac failure. The breathing was quite quiet and uninterrupted, and there was an absence of all bronchial irritation and frothing at the mouth. Vomiting occurred once in the first five cases, and then was both slight and transient. The largest quantity used was an ounce; this was given to a boy eighteen years of age, who had an organic systolic murmur at the apex of the heart, and he was kept unconscious for 35 minutes. In all these cases the drug was administered on a piece of lint or a towel. It was obtained from C. A. F. Kalbaum, of Berlin. It is a very expensive agent—I believe 32s. a pound—and should be kept in a capped bottle for the purpose of preventing evaporation."—*Med. and Surg. Rep.*, Jan. 24.

Formation of Ozone during the slow Oxidation of Phosphorus. By H. McLeod. The active substance formed during the slow oxidation of phosphorus is probably either ozone or peroxide of hydrogen. Air in which phosphorus is slowly oxidizing was drawn through a U tube, $9\frac{1}{2}$ inches long (filled with fragments of glass containing in succession sodic carbonate, a mixture of potassic bichromate and sulphuric acid, and potassic permanganate); the U tube was at the temperature of the air, or at 100°C. In both cases the gas which passed through rendered blue a solution of potassic iodide and starch; hydroxyl, under these circumstances, would be completely decomposed. In another series of experiments, the gas was passed through a narrow U tube, heated to 150° to 200°C., but no water was formed. It is extremely improbable that ozone and hydroxyl are simultaneously formed, as these substances decompose each other. The author, therefore, concludes that the gas obtained during the slow oxidation of phosphorus possesses the properties of ozone and not those of hydroxyl, the only known peroxide of hydrogen.—*Chem. and Drug.*, Jan. 15

Detection of Mineral Oils in Fats.—E. Geissler saponifies a known weight of the fat in a rather large, long-necked flask, and afterwards adds sufficient hot water to make the liquid reach into the neck of the flask. On allowing this to stand for some time in a warm place, unsaponifiable or still unsaponified oils, if present, will collect on the top of the liquid, and may be readily decanted or removed with a pipette, and the last portions, if necessary, with ether. On weighing this portion, the amount of the admixture is determined.—*Chem. Centralbl.*, 1879, p. 750, from *Corr. Bl. d. Ver. analyt. Chem.*

Durable Cement, prepared by J. Hart, consists of glue, white lead, oil, alum and borax.—*Ber. Chem. Ges.*, xii, p. 4194.

Cure for Corns.—Gezow recommends the following as reliable and painless: Dissolve 30 grams of salicylic acid and 5 grams of extract of *cannabis indica* in 240 grams of collodion. The solution is applied with a camel-hair pencil.—*Pharm. Ztschr. f. Russl.*, 1879, p. 580.

Improved Bleaching Process for Animal Tissues.—Tessié du Mothay places the substances in a moderately concentrated solution of potassium permanganate for a few minutes until they have become yellowish-brown, and then into a solution of sodium bisulphite, when they almost immediately become white.—*Ztschr. d. Allg. Oest. Apoth. Ver.*, from *Jahresber. Phys. Ver. Frankft.*

Flowers, grasses, moss, etc., may be readily colored by allowing them to remain for 12 to 24 hours in an alum solution, drying them, and then placing them, until the desired shade is obtained, into a not too concentrated anilin solution.

A purely green color can only be obtained by mixing much yellow with little blue. Blue flowers are turned red by dilute sulphuric acid, and green by ammonia. Red flowers are turned green by ammonia, and yellow flowers brown.

In order to impart a *white* color to flowers, grasses, moss, etc., they are exposed to sulphurous acid vapors; chlorine water cannot be used, because it is too energetic. After being colored the plants are washed carefully and dried.—*Pharm. Centralh.*, Jan. 22, 1880, p. 35, from *Fundgrube*.

Dyeing with Anilin Black.—Gravitz uses for 100 kilograms cotton a bath of 2,000 liters water, 8 liters pure anilin oil, 32 liters hydrochloric acid and 17½ kilograms potassium bichromate. The cotton, previously well boiled, is allowed to remain in the bath for about one hour, at the ordinary temperature; the bath is then gradually heated to about 90°C., and this temperature is retained until the black is no longer turned greenish by sulphurous acid. The black obtained does not turn green when in contact with air or sulphurous acid, and has a chestnut-brown gloss after washing, which can be changed to violet or blue by boiling with alkalies or soap.—*Pharm. Centralh.*, 1879, p. 342, from *Deutsch. Ind. Ztg.*

The presence of silk in textures is readily ascertained, according to Bœttger, by heating to the boiling point with a solution of zinc chloride of 60°B., when silk is dissolved, while linen and cotton are not altered.—*Chem. Centralbl.*, Nov. 12, 1879, p. 734, from *Jahresber. d. Phys. Ver. z. Frkft.*

Bleaching of Gray Feathers.—A. Viol and C. P. Duflo's method of bleaching gray feathers white consists in suspending them at a temperature of at least 30°C. in rectified oil of turpentine, or of other similar oils (f. e. oil of lavender, thyme, etc.), and exposing to the sun; in this liquid they are allowed to remain, being at the same time acted upon by light and heat, until the liquid evaporates, which usually takes 3 or 4 weeks, when they are rinsed off, dried and blued. Instead of in the bleaching liquid, they are sometimes suspended, with equal success, in an atmosphere impregnated with the vapors of one of the oils mentioned.—*Apoth. Ztg.*, from *Drog. Ztg.*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, February 17th, 1880.

The meeting was called to order by Mr. Robbins, who was requested to take the chair; the minutes of the last meeting were read, and a correction suggested by Dr. R. V. Mattison, having been made, they were approved.

The recent additions to the library were exhibited; these consisted of the volumes of the *Encyclopædia Britannica*, which were purchased with funds derived from the legacy of the late Algernon S. Roberts, one of the original members of our College; the other works were Muter's *Pharmaceutical and Analytical Chemistry*, Allen's *Commercial Analytical Chemistry*, Hassall's *Adulteration of Food*, Simmond's *Tropical Agriculture*, Simmond's *Waste Products and Undeveloped Substances*, The *British Year-book of Pharmacy* for 1879 and a copy of the *Dictionnaire des Termes Botaniques*, the latter presented by Mr. John E. Cook. It was thought desirable to call the especial attention of the members of the College to the fact that the committee having the library in charge are constantly adding such works, upon the various sciences german to pharmacy, as will maintain the character of the library.

Prof. Maisch exhibited about fifty excellent photographs of medicinal plants, which had been presented to the College by Mr. C. L. Lochman, of Bethlehem, Pa. The photographs are taken from carefully dried specimens, and show the botanical characters of the plants very well. They are sold at the remarkably low price of \$1.50 per dozen, and are well adapted to aid the student in botany and *materia medica*. It was suggested that the photographs would be best preserved in album form.

Prof. Maisch read a paper upon the fruit of *Adansonia digitata* (see p. 129), written by F. L. Slocum, and remarked that he had searched in numerous works at his command for an investigation on the constituents of the pulp of this fruit, but only to day had found, in an old German work, the statement, without mention of the author, that the acid taste was due to malic acid.

According to the promise made, Dr. Mattison exhibited a sample of lactopeptin, prepared by him in accordance with the formula published by the New York manufacturer. The difficulties experienced by others who had tried to prepare it were commented upon, and the method of avoiding them explained.

In answer to questions by Prof. Maisch, Dr. Mattison stated that pepsin possessed the power of dissolving albumen only in acid solution; that pancreatin was active only in alkaline solutions; that a mixture of the two in solution must result in the destruction of one, a fact which was also experimentally proven by Prof. Scheffer several years ago, and that the standard strength of pepsin, recognized in the United States, is the dissolving of 120 grains of coagulated albumen by 10 grains of saccharated pepsin in 5 or 6 hours (see "*Amer. Jour. Phar.*," 1872, p. 11).

Prof. Maisch referred to a paper recently published in the "*Chicago Medical Gazette*," according to which 10 grains of the patented preparation, called lactopeptin, dissolved two grains of albumen only.

Mr. Thompson read a letter from the manufacturers of the article, who have the proprietary right of the name, stating that it was impossible for more than one drug-

gist in a thousand to prepare, by the published formula, lacto-peptin similar to their own, and that the article thus made by others would never be uniformly the same.

Prof. Maisch alluded to the origin of this discussion, which arose from an inquiry for a formula of a preparation containing lacto-peptin and cinchona, and said that from what had been developed it was evident that no preparation could be made containing both pepsin and pancreatin in an active or unaltered state. He also alluded to the manner in which such and similar copyrighted or secret preparations are introduced, and the facility with which favorable reports and certificates are procured from physicians, and even from many professors of medical colleges.

In response to an inquiry for an efficient remedy for *tænia*, Prof. Maisch stated that he had successfully used the oleoresin of *Aspidium marginale*, prepared some years ago by Mr. Patterson. The oleoresin, diluted with an equal bulk of alcohol, had been agitated with about 15 or 20 times its weight of sugar, and afterwards with sufficient water to form a syrup. Given in this manner in divided doses, like oleoresin of male fern, it was well borne by the stomach. The same method had subsequently been tried by Mr. Kennedy with equal success, as reported by him to the Pennsylvania Pharmaceutical Association at its last meeting. The only points to be observed were that the rhizome should be sound and free from any brown or decayed portions.

After some conversation upon various topics, the meeting adjourned.

T. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Cincinnati College of Pharmacy.—The annual meeting was held January 14th. The reports of the officers and standing committees were read and appropriately referred; that of the retiring President, Mr. J. D. Wells, contained many valuable suggestions for future action.

The following officers were elected for the ensuing year: President, John Weyer; Recording Secretary, A. W. Bain; Corresponding Secretary, Louis Heister; Treasurer, Chas. Faust; Trustees—R. M. Byrnes, George Eger, H. H. Koehnken, J. D. Wells and John Ruppert.

A movement was set on foot relative to removing the stamp duty on perfumeries, toilet and medicinal articles, as demanded under Schedule A of the revised statutes of Internal Revenue. A preamble and resolutions were adopted, signed and forwarded to Congress, and a petition pertaining to the same subject and signed by most pharmacists of Cincinnati was forwarded to the same body.

At the monthly meeting, held February 11th, Professor Wayne presented for the cabinet the following specimens and made interesting explanatory remarks on each: bael fruit, coto bark, handsomely preserved underground parts of *cimicifuga* and *caulophyllum*, *Berberis aquifolia*, rare India rhubarb, lactate of calcium, sweet gum and botanical specimens of *liquidambar styraciflua*, *chionanthin*, a crystalline principle obtained by him from *chionanthus virginica*; *baptisin* deposited from the fluid extract, *cinnamic acid* from *benzoin*, containing only a trace of benzoic acid; *hippuric acid*, obtained to the amount of 10 per cent. from commercial benzoic acid

of German manufacture, and syrup of lactophosphate of calcium, which had undergone decomposition. In regard to the latter specimen Prof. Wayne remarked that lactic acid at first dissolved the calcium phosphate, that during the decomposition lactate of calcium and free phosphoric acid was formed, that this change frequently occurred over night, and that an analogous change takes place in syrup of lactophosphate of iron. The addition of hydrochloric acid does not prevent this change, but acts merely as a solvent of the salts precipitated.

Alumni Association of the St. Louis College of Pharmacy.—The fifth annual meeting was held at the college rooms, February 17th. After the officers of the past year and the various committees had read their reports, the following officers were elected for the ensuing year: President, J. W. Tomfohrde; Vice-Presidents, F. F. Reichenbach and O. E. Treuller; Recording Secretary, G. H. M. Goehring; Corresponding Secretary, L. Riesmeyer; Treasurer, Charles Gietner; Register, Ed. M. Till; Members of the Executive Board—Adolph Pfeiffer, John G. Goehring, Peter Hoffmann and Edmund Knoebel.

Iowa State Pharmaceutical Association.—Pursuant to the call noticed in our last number (p. 123), the convention of druggists and pharmacists of Iowa assembled in the Academy of Music, in the city of Des Moines, on February 10th, at 10 o'clock A.M. Mr. L. H. Bush, of Des Moines, was elected temporary chairman, and Geo. C. Henry, of Burlington, temporary secretary. The committee on credentials reported that 250 druggists of Iowa had responded to the circulars sent and applied to join the new organization; over one hundred of these were present at the opening session. The objects of the meeting were explained by Mr. George H. Schafer, and an address was made by the Hon. J. D. M. Hamilton in furtherance of the objects.

The following letter was received and referred for further consideration:

“SAINT PAUL, Feb. 6.—To the State Druggists' Association, Des Moines, Iowa. —GENTLEMEN: On behalf of the Western Wholesale Drug Association, I send you hearty greeting. The interests of our Associations are mutual, and our objects in a great measure identical. You seek by association to create good feeling, to remove prejudices, to correct wrong and unbusiness practices and to establish good and wholesome rules; you seek by combination to secure needed legislation and to remove burdensome and annoying taxation. We also have sought and are seeking, in the same way, the same ends. You desire to protect the educated and competent pharmacist against the ‘dangerous classes’ in the business; we have earnestly advocated this. The matter of adulteration in food, drink and medicine will undoubtedly have your attention. We hold that adulteration in drinks is bad, in food worse, in medicine criminal. We believe also that the wholesale druggist who cheapens quality to cheapen goods, and who adulterates his dealings with ‘baits’ and ‘catch-penny slips,’ or the retail druggists who adulterate with poor and unreliable goods what should be a pure and honest stock, comes under just condemnation. We are now seeking to secure the removal or essential modification of the present very unequal, unfair and arbitrary stamp act as applied to perfumery, medicines, etc., usually put up by the retail druggists. We trust your association will put itself on record as earnestly favoring such legislation, and instruct your secretary not only to co-operate with us in securing it, but also direct him to forward copy of your resolutions at once to the chairman of the Committee on Ways and Means at Washington. Very respectfully,

D. R. NOYES,

Secretary Western Wholesale Drug Association.”

At the afternoon session the following permanent officers were elected: President, Geo. H. Schafer, Fort Madison. Vice Presidents—Geo. B. Hugin, Newton; W. S. McBride, Marshalltown; F. W. Parish, Clarinda; Francis Lee, Clinton; C. P. Squires, Burlington. Secretary, H. W. Dodd, Fort Madison. Assistant Secretary, A. H. Miles, Des Moines. Treasurer, C. H. Ward, Des Moines. Executive Committee—W. B. Consins, Albia; W. E. Schrader, Iowa City; Norman Lichty, Des Moines.

A committee of five was appointed on Constitution and By-Laws, consisting of George W. Fuller, Keokuk; George C. Henry, Burlington; C. A. Weaver, Des Moines; E. L. Boerner, Iowa City; D. B. Snyder, Lyons, who were to report on the following morning. The following delegates to the American Pharmaceutical Association were appointed: T. W. Ruete, Dubuque; C. R. Wallace, Independence; A. R. Townsend, Boone; J. W. Satterthwait, Mt. Pleasant; Max Conrad, Ottumwa.

The bill for the regulation of the practice of pharmacy and the sale of medicines and poisons in the State of Iowa, now before the House of Representatives, was taken up for discussion, by sections, and with slight modifications approved.

On the second day the Constitution and By-Laws reported by the special committee were considered and adopted. A reply to the Western Wholesale Drug Association was adopted, pledging their co-operation in the removal of the irksome stamp duty on perfumery, etc., and the meeting was addressed on the same subject by Mr. P. Van Schaack, of Chicago.

A communication from the Women's Christian Temperance Union of Iowa on the subject of liquor selling by druggists was received and responded to.

A memorial to the Legislature of Iowa was adopted and signed, urging the passage of the pharmacy bill now pending before that body.

The chair appointed the following standing committees: Committee on Trade Interests—R. W. Crawford, Fort Dodge; A. D. Cram, Des Moines; C. H. Holmes, Magnolia. Committee on Pharmacy and Queries—Emil L. Boerner, Iowa City; Herman Tiarks, Monticello; Martin O. Oleson, Fort Dodge. Committee on Legislation—L. H. Bush, Des Moines; D. Q. Storie, Chariton; D. B. Snyder, Lyons.

After passing a vote of thanks to the druggists of Des Moines, and those who assisted in forming the association, an adjournment was had to meet again in Des Moines on Tuesday, February 8th, 1881.

Pharmaceutical Society of Great Britain.—At the pharmaceutical meeting held February 4, Mr. G. F. Schacht, Vice President, presiding, a large number of drugs were presented by the government through Sir Joseph Hooker, and were commented upon by Mr. Holmes, Prof. Bentley, Dr. Cooke and others. The specimens formed but a small portion of the materia medica collection which were originally in the India Museum.

Mr. Greenish and Dr. Symes spoke on the use of the *polarimeter*, and the latter gentleman described a new instrument made for him by Messrs. Field, of Birmingham, for the price of five guineas.

Mr. Henry Collier read a paper on *tincture of senega as an emulsifying agent*.

Referring to his paper on the use of tincture of quillaia for the same purpose (see this journal, Jan., p. 41), the author reviewed the literature of senegin or polygalic acid, and stated that its emulsifying power was equal to that of saponin. Using half an ounce of water, 5 minims of tincture of senega will emulsionize of fixed oils ℥ss, ol. terebinthinæ ℥xx, copaiba ℥ss, oleores. filicis ℥i, chloroform ℥x. For emulsifying resins, tincture of senega is not as useful as acacia or tragacanth. Tinct. tolu ℥40, tinct. senegæ ℥20, and water q. s. ad ℥i, make a good emulsion, but the quantity of tincture is large.

Mr. Greenish regarded the introduction of tincture of senega as an emulsifying agent as inadmissible. Mr. Gerrard regarded it admissible for emulsifying tar.

At the next meeting, Prof. Redwood will read a paper on dialyzed iron and other analogous iron preparations.

EDITORIAL DEPARTMENT.

State Pharmaceutical Associations.—We have repeatedly urged upon our readers, in different sections of the country, the importance of uniting in the organization of State Pharmaceutical Associations. Many of the States bordering on the Atlantic have such organizations; several are in existence in the valleys of the Mississippi and Ohio; an organization has been effected in Texas, and, several years ago, one was formed in California. We are pleased to be able to give, in the present number, an account of the formation of another State society, that of Iowa, which commences its existence with the respectable number of 250 members and with the demand for a pharmacy law. The Iowa State Pharmaceutical Association thus makes a proud record for itself at the very start, and we doubt not it will maintain it in the future. From the accounts received the transactions were characterized by an earnestness of purpose, which deserves and insures success.

Along the eastern, southern and northern borders of the United States, as well as in the interior, there are still a number of States in which such associations have no existence; we trust that the gathering at Indianapolis last September will have sown the seeds, and that their speedy germination will be stimulated by the example set by the druggists and pharmacists of Iowa.

OBITUARY.

ADOLPHUS FREDERICK HASELDEN died in London February 4. The deceased has rendered valuable service to pharmacy, and more especially to the Pharmaceutical Society of Great Britain, of which body he was vicepresident from 1869 to 1871, when, on the resignation of Mr. Sandford, he was elected president, in which capacity he served until 1873. Mr. Haselden joined the Pharmaceutical Society as an associate at its commencement, in 1841, and as a pharmaceutical chemist in 1865, and has been one of the examiners, with the exception of a short interval, from 1864 to 1877. His contributions to pharmaceutical literature were characterized by being eminently practical and frequently marked by brightness and piquancy. A number of his papers will be found in previous volumes of this journal.

THE AMERICAN JOURNAL OF PHARMACY.

APRIL, 1880.

ALBUMINATE OF IRON.

BY C. LEWIS DIEHL.

Among the ferric compounds introduced during the past few years, albuminate of iron has attracted some attention abroad, but has been noticed only to a limited extent in the United States, if I may be allowed to judge by the demand for it in this locality. Recently, however, I was called upon to prepare a solution of albuminate of iron by a formula suggested by Dr. W. Dönitz, of Tokio, Japan. This formula differed so radically from those that had previously come under my observation, both in the manipulation directed and the proportion of ferric chloride and egg albumen employed, that I was led to make some comparisons, and eventually a series of experiments, during the course of which some facts were developed that seem to merit publication. But before giving these experiments in detail a brief review of the methods and experiments that have been made public, or as far as they have come under my observation, is necessary; and it is also necessary to explain that, in so far as the method of Dr. H. Hager is concerned, which anticipates me in the application of common salt to the precipitation of the ferric compound, but differs widely in some particulars, I had no knowledge of it at the time my method was developed.

*Friese*¹ first recommended albuminate of iron for the treatment of chlorosis, rhachitis, etc. He obtained it by adding 10 grams of liq. ferri sesquichlor., *Phar. Ger.*, to the white of one egg, washing the precipitate with distilled water until the excess of ferric chloride was removed, then macerating the residue for 24 hours in 500 cc. of distilled water and 12 drops of hydrochloric acid to effect solution. The albuminate of iron so produced is said to contain 2.8 per cent. iron.

*Kobligk*² observed that an albuminate containing uniformly as much iron as stated by Friese cannot be obtained. Also, that the albuminate

¹"Berlin. Klin. Wochenschr.," 1877; "Phar. Centralh.," Aug. 2, 1877, p. 251.

²"Schweiz. Wochenschr. f. Phar.," 1877, No. 47, p. 381.

is somewhat soluble in water, and that therefore it should not be mixed with large quantities of that fluid, but should be washed upon a filter as long as the water passes clear.

*Bernbeck*¹ makes the same observation as *Kobligk* regarding the solubility of the albuminate produced by *Friese's* method, but ascribes the solubility to the excess of hydrochloric acid in the official (Phar. Ger.) solution of ferric chloride. He recommends that 6 parts of dry ferric chloride, obtained by evaporating the official (Phar. Ger.) liquor, be dissolved in 10 parts of distilled water, the solution filtered and mixed intimately with 20 parts of albumen; the brown-yellow magma is transferred to a wetted cloth, expressed with the hands, and this is repeated with the addition of distilled water until the excess of ferric chloride is removed. The residue is then dissolved by macerating it for one or two days in half a liter of water containing 12 drops of muriatic acid. By parts, the author evidently means grams; by albumen, the white of eggs.

*Biel*² recommends the following method: 10 grams of dry egg albumen are dissolved in 100 grams distilled water, clarified by subsidence, and mixed with 3.2 gram liq. ferr. chlor. of 30 per cent. (or 2.4 grams Phar. Ger.), previously diluted with 10 times the quantity of water; the mixture is gently heated and agitated vigorously, after which 20 grams of 90 per cent. alcohol and sufficient water are added to make the mixture weigh 200 grams. When used, the concentrated liquor is to be diluted with four times its weight of water, and then contains 0.033 per cent. iron. By subjecting the solution to dialysis, a neutral product was obtained, but it still contained chlorine, and appeared to possess no advantage over the normal solution. Dry albuminate of iron is obtained by evaporating the solution to syrup, spreading this on glass plates, and drying at 40°C. (=104°F.) The golden-yellow lamellæ contain 3.34 per cent. iron, and readily dissolve in warm water after the addition of 1 or 2 drops of hydrochloric acid (to how much of the albuminate?).

*Holdermann*³ records some experiments relative to the conditions which favor the precipitation of the albuminates, the influence of acidity, alkalinity, etc. The nature of the acid in the ferric salt employed appears to exercise a decided influence on the composition (proportion

¹"Arch. d. Phar.," 1877, Dec., p. 521.

²"Phar. Zeitschr. f. Russ.," 1878, No. 7, p. 193.

³"Arch. der Pharm.," Feb., 1878, p. 149.

of iron) of the albuminate, but the latter, after its formation, does not appear to become changed in its composition by fractional washings.

*Merck*¹ recommends the method of Dr. Hoffmann(?) for preparing dry albuminate of iron. Fifteen parts crystallized ferric chloride (containing 20 per cent. Fe), or 20 parts liquor ferr. sesquichlor. (Phar. Ger.), are dried with 10 parts dextrin at 40° to 50°C. (=104° to 122° F.), and pulverized; then 80 parts pulverized egg-albumen are mixed with it. He describes it to form lustrous brownish-red crystals (?), not hygroscopic, soluble in 50 parts cold water, and most readily at a temperature of 30° to 35°C. (=86° to 95°F.). A slight deposit may form on standing, which is readily dissolved by a few drops of hydrochloric acid.

*Dönitz*² gives the following formula: The white of one or two eggs is thoroughly mixed with about 150 cc. water, and a solution of six drops of officinal (Phar. Ger.?) solution of ferric chloride in 30 cc. water is gradually added, agitating vigorously after each addition. The turbidity at first produced gradually disappears on the further addition of the ferric solution, but the addition of a few drops of hydrochloric acid may be necessary if the ferric solution has been added too rapidly. The solution is finally filtered, which it does more easily than if it is attempted to filter the solution of albumen before the addition of ferric chloride. Upon evaporating the solution at a moderate temperature a permanent and readily soluble dry albuminate is obtained. Finally,

Hager, in an Appendix (p. 1338) to his recently-completed "Handbuch der Pharmaceutischen Praxis," gives the following formula for "ferrum albuminatum saccharatum": 100 cc. albumen (from 5 hen's eggs) are vigorously shaken with 400 cc. water, the solution is strained without expression, mixed with 250 cc. of a cold saturated solution of common salt, and then with 40 cc. liq. ferri sesquichlor. (Phar. Ger.) diluted with 160 cc. water. After about half a day, the mixture is diluted with 3 liters of water, well shaken, the precipitate collected upon a muslin strainer, washed with water, etc. The well-drained magma, which when dry amounts to about 10 grams, is mixed with 60 grams of powdered refined sugar, dried at the temperature of the water-bath on porcelain plates, weighed, powdered, and mixed with sufficient sugar to make 100 grams of saccharate. This contains 0.65 to 0.66 per cent. ferric oxide; the pure albuminate 6.5 to 6.6 ferric

¹"Phar. Zeit.," March, 1878.

²"Berlin. Klin. Wochenschr.," Sept. 8, 1879, p. 535.

oxide. The same preparation may be obtained by precipitating the solution of the albuminate of iron with alcohol, etc.

As mentioned, my first practical acquaintance with albuminate of iron was with the solution produced by the formula of Dr. Dönitz. This solution is, as described by the author, a perfectly transparent light-brown liquid, nearly tasteless, and will keep well in cool weather for several weeks. It contains, as I have determined by calculation and subsequent experiments, an excess of albumen, even when the smaller quantity of egg-white is employed, for which reason the latter quantity was adopted for the experiments made with this solution. When such a solution is evaporated in a current of warm air a light-brown, transparent residue is obtained, which may be detached in the form of scales, and readily furnishes a powder having a very light cinnamon-brown color. This *dry* albuminate also corresponds to the description of Dr. Dönitz, being readily dissolved by water to form a clear solution, particularly if a modicum of dilute hydrochloric acid is added. The yield, however, is necessarily very small, owing to the dilute character of the solution;¹ and the preparation of dry albuminate from such, on any considerable scale, is therefore out of question; and though subsequent experiments showed that a far more concentrated solution of albuminate of iron could be obtained by a modification of the method, it nevertheless seemed desirable to ascertain some process—if possible one of precipitation—whereby the evaporation and consequent exposure of any considerable proportion of liquid should be avoided. To this end, it became necessary to subject the known or accepted characters of albumen and its compounds to critical review, when, among others, the following points bearing directly upon the subject under consideration were developed.²

1. Albumen is not precipitated from its aqueous solutions by ferric chloride,³ and even prevents the precipitation of the oxide of that metal by alkalies.

¹ Egg-white contains about 12.5 per cent. dry albumen (which quantity has been accepted by me in my experiments), consequently six fluidounces of Dönitz's solution will yield only about one drachm of albuminate.

² The principal works consulted were "Graham-Otto's Lehrbuch der Chemie," "Organische Chemie," vol. iii, by H. v. Fehling, and "Dictionary of Solubilities of Chemical Substances," by Frank A. Storer.

³ This does not, however, apply to the egg-white in its natural condition, as is evident from the methods hitherto pursued for the preparation of albuminate of iron.

2. Albumen is precipitated from its aqueous solutions by dilute sulphuric, nitric, hydrochloric and pyro- and meta-phosphoric acids; but by the ordinary tribasic phosphoric acid, or by organic acids, only upon the addition of chloride or sulphate of sodium, or other alkali salts.

3. Albumen appears to form *acid* and *normal* salts, the first containing one molecule of base, the second two molecules. It also appears to combine directly with some salts—principally basic—in the same proportions.

4. The *acid* salts of albumen are sometimes soluble, the *normal* salts generally insoluble in water; but neither are insoluble in excess of metallic salt or albumen.

5. The formula for albumen is, according to Lieverhühn, $C_{144}H_{122}N_{18}S_2O_{44}$, and is so generally accepted. That of its *acid* salts would be represented by the formula $MO, C_{144}H_{122}N_{18}S_2O_{44}$, and that of its *normal* salts by $2MO, C_{144}H_{122}N_{18}S_2O_{44}$.

It becomes evident, from the above, that my inquiries gave no clue to a precipitate for albuminate of iron, and it was therefore by a purely empirical process of reasoning that I decided to try the effect of a saturated solution of common salt upon a quantity of Dönitz's solution of albuminate of iron, to which an excess of ferric chloride had been previously added. The result was an immediate, copious and evidently complete precipitate, which my experiments seem to prove to be an albuminate of definite composition, and which is obtainable from solutions containing an excess of albumen as well as from such that contain an excess of ferric chloride. The following is a brief account of the experiments made:

1. To a quantity of Dönitz's solution corresponding to one egg-white, one fluidrachm liq. ferri chlor., U. S. P., diluted with water and partly neutralized with ammonia, was added, whereby no other change than a slight deepening in color was produced. On now adding a quantity of saturated solution of chloride of sodium (hereafter designated as "solution of salt"), a copious, light brown precipitate was produced, while the supernatant fluid had a decided yellow color, gave abundant evidence of iron, and only faint evidence of albumen. The precipitate was collected, expressed, shaken with distilled water, in which it dissolved completely, and again precipitated with solution of salt. The filtrate now passed colorless, and gave only faint evidence

¹ The old notation is retained in this paper.

of iron and of albumen. The strongly expressed precipitate constituted a translucent mass, light brown in thin, dark reddish-brown in thick layers, very friable when dry, and then easily reduced to a very fine powder having a light cinnamon-brown color. It was readily soluble in water. Its quantity was not determined.

2. A quantity of Dönitz's solution corresponding to one egg-white (one ounce, more or less) yielded, upon evaporation in a current of warm air, 56 grains of albuminate of iron in the form of friable, light yellowish-brown, translucent scales, which produced a very light cinnamon-brown powder.

3. A portion of the same solution, corresponding to the same quantity of egg-white, was treated with one-third its volume of solution of salt, the precipitate collected, washed with a mixture of one volume of solution of salt and three volumes of distilled water (hereafter designated "dilute solution of salt"), subjected to powerful expression and dried. It weighed 34 grains and possessed all the characters of the albuminate of iron obtained by Exp. 1. The filtrate from the precipitate, however, gave but faint evidence of iron and abundant evidence of albumen, the washing being continued as long as decided evidence of the latter was given. Both the filtrate and washings appeared colorless.

From these experiments it became evident that, while in Exp. 1 a very decided excess of ferric chloride had been used, in Exp. 2 and 3 albumen was in excess. This excess of albumen is represented in the dry albuminate obtained by Exp. 2, but is removed by washing in Exp. 3, just as the excess of ferric chloride is removed by washing in Exp. 1. The quantity of ferric chloride employed in Exp. 1 was therefore reduced, some attempt being also made to establish a working formula.

4. 10 troyounces of egg-white were diluted to 20 fluidounces with distilled water, a solution of 3 fluidrachms of liq. ferri chlor., U. S. P., in 10 fluidounces of distilled water was added, and the solution filtered. 10 fluidounces of solution of salt were now added, the precipitate collected on wetted muslin, washed with dilute solution of salt, drained, expressed powerfully, and dried. The product weighed 9 drachms (= 11.25 per cent. of the egg-white employed) and had all the characters of the albuminate obtained by Exp. 1. The filtrate was yellow, though much lighter than that obtained by Exp. 1; the washings finally gave evidence only of traces of iron and of albumen. The press cake, though obtained by powerful pressure, was translucent dark reddish-

brown only in the centre, the margins, upon which the pressure was evidently not so strong, being opaque and light brownish.

5. One troyounce of egg-white was treated precisely as in Exp. 4, but instead of precipitating the albuminate, the solution was evaporated to dryness. It yielded 60 grains ($=12.5$ per cent. of the egg-white employed) of dry substance in the form of dirty dark-brownish scales, having a greenish tinge, and when powdered had a light brownish-grey color, very distinct from that of the products previously obtained.

6. Experiments 4 and 5 having convinced me that the quantity of ferric chloride used was still in excess, a series of experiments were made, which are not necessarily given in detail, but which consisted in adding variable proportions of ferric chloride to solution of egg-white, precipitating the solutions, and selecting from among the proportions so determined that in which there was evidence of a decided but small excess of ferric chloride in the filtrate. This was found to be 50 minims of liq. ferri chlor., U. S. P., to 4 troyounces of egg-white, and operating with these proportions at different times, the following yields of albuminate of iron were obtained, all of which corresponded in their physical characters, solubilities, etc., with the albuminate obtained by the first experiment :

4	troyounces	egg-white	yielded	214	grs.	$=$	11.23	per cent.	albuminate.
12	"	"	"	720	"	$=$	12.50	"	"
22	"	"	"	1312	"	$=$	12.42	"	"

With the above proportions the filtrate still had a faint yellow color and gave a decided ferric reaction, but only a faint reaction for albumen, while, when completely washed with dilute solution of salt, the final washings failed to give any appreciable evidence of either.

Assuming now, for the purpose of comparison, that albuminate of iron is a definite compound in which 1 molecule of ferric chloride (Fe_2Cl_3) is united with 1 molecule of albumen ($\text{C}_{144}\text{H}_{122}\text{N}_{18}\text{S}_2\text{O}_{44}$),¹ the following table will show the relation of the former to the latter in the different processes that have been suggested.

¹ A normal salt would require 2 molecules Fe_2O_3 to 3 molecules albumen.

Process.	Liq. Ferri Chlor.		Natural Egg-white (taken to contain 12 5 p. c. dry albumen.	Dry Egg-albu- men	Excess of dry egg- al- bumen di- rected.	Excess of Liq. Ferri Chlor., U. S. P., directed.
	U. S. Ph. sp. gr. 1'355 =12'8 p.c. Fe	Phar. Ger. sp. gr. 1'480 =15 p. c. Fe				
	Gram.	Gram.	Grams.	Grams.	Grams.	Gram.
Theory,	1'0	0'854		3'669		
Friese's,	1'0	0'854	2'628	0'341		0'907
Bernbeck's,	1'0	0'854	2'800	0'350		0'9047
Biel's,	1'0	0'854		3'570		0'0272
Merck's,	1'0	0'854		3'410		0'0908
Dönitz's, <i>a</i> ,	1 0	0'854	40'960	5'120	1 451	
Dönitz's, <i>b</i> ,	1'0	0 854	82'000	10'250	6'581	
Hager's,	1'0	0'854	1'640	0'205		0'9442
Diehl's,	1'0	0'854	29'030	3'629		0'0111

An examination of the table will make it clear that in Friese, Bernbeck's and Hager's process the quantity of ferric chloride is largely in excess of that required to form an albuminate; that Dönitz directs a considerable excess of albumen when the smaller quantity (*a*) of the latter is employed, and a very large excess when the larger quantity (*b*) is used; while Biel and Merck, whose processes are based upon the direct combination of ferric chloride and albumen, direct proportions that agree well with that theoretically required. The quantity used by me corresponds still more closely with that required by the formula provisionally accepted, and the proportion having been arrived at experimentally, before any calculation of the required quantity was made, seems to support the view that in the formation of albuminate of iron 1 molecule of ferric chloride and 1 molecule of albumen are concerned. The large excess of ferric chloride used by Hager is, as has been shown, unnecessary, and was probably adopted by him without proper reflection. That employed by Friese and Bernbeck, however, seems to have been arrived at by practical observation, and, inasmuch as I had failed to obtain precipitates by the direct action of solution of ferric chloride upon egg-white, if the latter was at all diluted with water, the following experiments were made to throw some light upon this subject, as well as upon some points embraced in the foregoing.

7. To 204 grains of egg-white, beaten to destroy stringiness, 75 minims of liq. ferri chlor., U. S. P., (corresponding to Friese's method

and proportions) were added. A light-yellow turbid magma was produced, which was mixed with an equal volume of water, transferred to a filter and washed with water until the washings passed colorless. The residue upon the filter, which was quite bulky, formed a gelatinous mass upon standing, and, when diluted with water after it had attained that condition, failed to pass through the filter. After several days the contents of the filter were further diluted with water and transferred to a new filter, when, very slowly, the solution passed through the filter. The clear liquid yielded, on evaporation, an albuminate of iron in the form of transparent yellowish-brown scales. Owing to unavoidable loss its quantity was not determined.

8. Simultaneously with this experiment (7) a parallel experiment was made in which liq. ferr. chlor. was evaporated to dryness, redissolved in water, filtered and then added to the pure egg-white (corresponding to Bernbeck's method and proportions). In this instance a copious precipitate was obtained which was quite distinct from that obtained by Friese's method, and may be described as granular. It was very readily washed, but when allowed to drain over night it had completely changed its character. A gelatinous thick liquid had formed, a portion of which had passed through the filter, and was consequently lost. The receiving vessel being changed, the liquid was further diluted with water, when it very slowly passed through the filter, forming a clear liquid. This yielded a dry albuminate corresponding in appearance with that obtained by Exp. 7. It was not weighed.

9. Two troyounces of egg-white were dissolved in 7 fluidounces of water, 5 fluidounces of solution of salt added and the solution filtered. The filtration proceeded quite slow when compared with the filtration of a similar solution of albumen to which ferric chloride had been added in place of salt. Upon the addition of 25 minims of liq. ferr. chlor., U. S. P., previously diluted with $3\frac{1}{2}$ fluidounces of water, a precipitate of albuminate of iron was obtained, just as in the instances in which the inverse process was employed, and the filtrate and washings gave very faint evidence of albumen, though the former gave decided evidence of iron. The albuminate produced had the same character as that obtained by Exp. 1.

10. The same quantity of the same egg-white was dissolved in water, the solution mixed with solution of salt, and filtered just as in Exp. 9. Diluted hydrochloric acid was then added drop by drop. When 25 drops had been added, the liquid became permanently turbid; with

5 drops more a decided turbidity was produced, and after adding 5 drops more, a further addition failed to produce a precipitate in the clear filtrate. The precipitated albumen was not subjected to nearer experiment, but it deserves a thorough examination since there were decided evidences of change, *it being no longer coagulable by heat*. Its quantity, also, was not determined, but it appeared to be less, both in volume and weight, than that obtained from the same albumen by precipitation with ferric chloride.

The first two experiments (7 and 8) have shown, beyond a doubt, that concentrated solutions of albumen (in the form of the natural egg-white) are readily precipitated by ferric chloride, either in the presence or absence of hydrochloric acid, but that the precipitates obtained under either condition again become soluble when the excess of ferric chloride has been removed by washing. They likewise show that while Bernbeck's view, that the solubility of the albuminate is due to excess of hydrochloric acid in the liq. ferri chlor. is probably incorrect, the condition in which the albuminate of iron is precipitated when ferric chloride, free from hydrochloric acid is employed, is of such a character that it can be readily washed so as to free it from excess of ferric chloride; while that obtained by Friese's method, being in a very finely divided condition, cannot be washed with the same readiness, and that, therefore, a portion of the precipitate, being completely freed from excess of ferric chloride, may again enter solution before the remainder is sufficiently washed.

Experiment 9 has shown that the process of precipitation, by the intervention of common salt, can be inverted so that the ferric chloride will act as the final precipitant.¹ The method, however, has the disadvantage in that the solution of albumen and salt filters very slowly, while that of albumen and ferric chloride filters with comparative rapidity. It is not clear, on the one hand, why common salt should effect the precipitation in dilute solutions of albuminate of iron, and why, on the other hand, ferric chloride should only precipitate albumen when it is in its natural solution. Both propositions must for the present be accepted as facts, which may find explanation by further experiments. It may be, furthermore, inferred that the small quantity of chloride of sodium and other salts, naturally present in egg-white in its concentrated natural solution, is sufficient to effect precipitation upon the addition

¹ This is already shown by Hager's method, but his method was not known to me at the time the experiment was made.

of ferric chloride ; but in this event a much smaller quantity of the latter than that employed by Friesse or Bernbeck should effect the same result.

Experiment 10 was made simply to determine the probable effect of an excess of hydrochloric acid in the liq. ferri chlor., and is, perhaps, of greater interest in its relation to albumen itself than in its relation to albuminate of iron. Judging from the action of ferric chloride, free from hydrochloric acid, upon albumen (Exp. 8), as well as from the evidently incomplete precipitation of albumen by the dilute hydrochloric acid (Exp. 10), it seems justifiable to conclude that in the precipitation of albuminate of iron in the presence of common salt the action of the ferric chloride is independent of the presence of free hydrochloric acid. The whole question in these bearings is, however, too intricate to be disposed of without further and comprehensive study, and may rest here for the present.

In the foregoing a ready method for preparing dry albuminate of iron has been given. It remains to consider whether the product obtained by the method is uniformly the same. In order to satisfy myself on this point the ferric oxide was determined by a method, which, for the purpose, appeared to me sufficiently accurate, but would not be sufficiently so if my object had been the establishment of a formula for the compound.

1.0 gram of albuminate of iron obtained by Exp. 4 was subjected to incineration, at a dull red heat, until it ceased to lose weight. The weight of the ash being ascertained, this was exhausted with water, the solutions obtained were evaporated, dried, and heated at an incipient red heat as long as it lost weight. The weight of soluble salts (principally chloride of sodium) so determined being deducted from the total ash, the quantity of ferric oxide in one gram of the original albuminate was ascertained, and from the figures so obtained the percentage of ferric oxide in the *pure* albuminate was determined as shown in the following :

1.0 gram albuminate, Exp. 4, incinerated until it ceases to lose weight =	0.121 gram ash
Ash yielded to water,	0.073 " salt
Difference is ferric oxide,	0.048 " Fe_2O_3

100 grams of the albuminate, therefore, contains 7.3 grams of salt

and 92.7 grams pure albuminate of iron, representing 4.8 grams of ferric oxide.

Then, if 92.7 grams of pure albuminate contain 4.8 grams of ferric oxide, 100 grams of pure albuminate contain 5.16 grams = 5.16 per cent. Fe_2O_3 .

The experiment showed that the product obtained by the process of precipitation contains a considerable proportion of chloride of sodium. Remembering that the expressed precipitate was translucent in the centre and opaque in the margin, a portion of the clear central mass of the press cake obtained by Exp. 6 was dried and treated precisely as the above. The result was as follows:

1.0 gram clear albuminate, Exp. 6, yielded,	0.105 gram ash
Ash yielded,	0.056 " salt
Difference,	0.049 " Fe_2O_3

100 grams of this albuminate, therefore, contains only 5.6 grams of salt, and the pure albuminate of iron, constituting the remainder, = 5.19 per cent. Fe_2O_3 .

Equal portions of the three lots of albuminate of iron obtained according to Exp. 6 were now powdered together, and 1 gram of this powder treated as above. The result now was as follows:

1.0 gram mixed albuminate, Exp. 6, yielded,	0.120 gram ash
Ash yielded,	0.072 " salt
Difference,	0.048 " Fe_2O_3

Showing that 100 grams contained 7.2 grams of salt, and that the pure albuminate contained 5.17 per cent. Fe_2O_3 .

It remained now to subject the albuminates of iron obtained by Friese's (Exp. 7) and Bernbeck's (Exp. 8) methods to similar quantitative examination. But, inasmuch as the peculiar method by which these albuminates were obtained seemed to exclude the presence of saline components other than ferric compounds, these were simply incinerated, and the residue weighed as ferric oxide.

1 gram albuminate, Exp. 7, yielded 0.048 gram = 4.8 per cent. Fe_2O_3

1 gram albuminate, Exp. 8, yielded 0.048 gram = 4.8 per cent. Fe_2O_3

thus pointing to identity in their composition, notwithstanding that the one was obtained with normal solution of ferric chloride, and the other with ferric chloride which had been previously deprived of its excess of acid.

As before stated, the method of determination is not such as should be employed to secure that degree of accuracy that is necessary to determine the chemical constitution of albuminate of iron. The results are, however, sufficiently accurate to show that the compound obtained by the method of precipitation is uniform in its composition, and points out very clearly that an albuminate of iron of definite constitution exists.

What its precise constitution may be, however, is a question which I must leave to others, who have more time for such investigation, to decide; and I will simply observe in this connection that, if the formula of albuminate of iron represents 1 molecule albumen ($C_{144}H_{122}N_{13}S_2O_{22}=1612$) and 1 molecule ferric chloride ($Fe_2Cl_3=162.5$), the compound would represent 4.5 per cent. ferric oxide; or, if it represents 1 molecule each of albumen and ferric oxide ($Fe_2O_3=80$), it would contain 4.728 per cent. ferric oxide.

The following table shows the percentages of ferric oxide that have been obtained or are claimed for the different albuminates:

Albuminate.	Ferric Oxide.	Corresponding to	
		Metallic Iron.	Ferric Chloride.
If $Fe_2Cl_3, C_{144}H_{122}N_{13}S_2O_{44}$.	4.500 p. c.	3.147 p. c.	9.150 p. c.
If $Fe_2O_3, C_{144}H_{122}N_{13}S_2O_{44}$.	4.728 "	3.304 "	9.600 "
Friese's,	3.998 "	2.800 "	8.122 "
Biel's,	4.769 "	3.340 "	9.719 "
Hager's,	6.500 "	4.550 "	13.201 "
Diehl's, Exp. 4, .	5.160 "	3.612 "	10.479 "
Do. clear, " 6, .	5.190 "	3.633 "	10.540 "
Do mixed, " 6, .	5.170 "	3.619 "	10.500 "
Friese's, " 7, . .	4.800 "	3.360 "	9.748 "
Bernbeck's, " 8, .	4.800 "	3.360 "	9.748 "

Finally, my observations may be summed up as follows:

1. Albuminate of iron, in a dry condition, can be obtained with great ease by a method of precipitating its solutions with common salt.
2. So obtained, whether from solutions containing an excess of

ferric chloride or an excess of albumen, it is constant in its composition as regards the relation of albumen to iron.

3. The dried and powdered product is readily dissolved by water.

4. Obtained by the method recommended, it contains a certain percentage of common salt, the presence of which, however, does not interfere with its solubility, nor, it is likely, with its therapeutic application.¹

5. The process recommended is rapid, and conducted under conditions in which the albumen cannot be unfavorably affected by exposure to the heat of summer; and, even if exposed for a longer period than is necessary, the presence of salt is calculated to prevent the changes to which albumen or its compounds, in a moist condition, are subject.

6. The albuminate represents about 5 per cent. of ferric oxide, or 10 per cent. of ferric chloride.

Louisville, Ky., March 20, 1880

PHARMACEUTICAL NOTES.

BY R. F. FAIRTHORNE, PH.G.

Emulsion of Codliver Oil and Phosphate of Calcium.—The following will be found to make a satisfactory and pleasant preparation :

R	Calcii phosphatis,	.	.	.	.	3ii gr. viii
	Acid. hydrochlor.,	.	.	.	.	q. s.
	Liq. ammoniæ,	.	.	.	.	q. s.
	Aquæ,	.	.	.	.	f3iii

Mix phosphate with a small portion of the water, and the acid in sufficient quantity to dissolve, filter through cotton and add the remainder of the water. Pour into this an excess of solution of ammonia,

¹Dr. Hager recommends for his preparation, which is preliminarily obtained essentially like mine, that, after the addition of solution of salt, the mixture be diluted with a considerable quantity of water, the precipitate collected, and washed with water *so as to remove the salt as much as possible*. I have not had opportunity to test the value of this direction, though my observations lead me to fear that the entire precipitate might by such procedure again enter solution. Some experiments made within the last few days show that a considerable quantity of the salt can be removed from the dry powder by shaking it with water and immediately throwing the mixture on a filter. The larger portion of the liquid passes colorless, and contains much salt; but the residue on the filter very soon assumes a gelatinous condition, and finally dissolves. It is my opinion that the larger part of the salt may be removed from the moist press-cake by immersing it in water until it begins to exercise solvent action on the albuminate, then removing the cake and drying.

wash the precipitate on muslin until the washings are tasteless, and, after thoroughly squeezing it, mix it with the following ingredients, viz.:

Ol. morrhuae,	f℥iii
P. g. acaciæ,	℥vi
P. sacchari albi,	℥x
Ol. sassafras,	gttxv
Ol. gaultheriæ,	gttvi
Ol. cinnamomi,	gttiv
Aquæ, q. s. ft.,	f℥viii

Rub the phosphate of calcium with the sugar and gum in a mortar, and water sufficient to reduce it to the consistence of cream, add this to the oil previously put in a bottle and shake well for a few minutes. The rest of the water may then be poured in a little at a time. The essential oils can be mixed with the codliver oil.

How to Preserve Tragacanth Paste.—To half a pint of tragacanth paste are added 25 drops of oil of sassafras. This will be found to preserve it without spoiling for three months, even in warm weather.

A quick way to make Paregoric.—If, instead of powdered opium, a quantity of tincture of opium containing an equivalent proportion is used, paregoric can be made in ten minutes equal in every respect to the official, provided the laudanum used is of proper strength, thus:

R Tinct. opii,	f℥iss and 48 minims
(which contains the medicinal virtues of 1 drachm of p. opium)	
Acid. benzoic.,	sixty grains
Camphoræ,	forty grains
Ol. anisi,	one fluidrachm
Mel. desp.,	two troyounces
Alcohol. dilut.,	thirty and one-half fluidounces

Mix and filter.

XANTHOXYLUM CAROLINIANUM.

BY GEORGE HAVENS COLTON, PH. G.

(From an Inaugural Essay.)

A quantity of the bark was carefully examined to insure its identity and freedom from admixture with other barks. A portion of the bark was exhausted with alcohol and the tincture evaporated to the consistence of a soft extract. This was treated with petroleum benzin until a portion of the benzin left no residue on evaporation. Upon evaporating, a residue was obtained, consisting of a greenish colored fixed oil, of an intensely acrid taste, soluble in alcohol, ether and chloroform, and mixed with a crystalline substance.

These crystals, after freeing from oil by washing with benzin, and repeated crystallization from alcohol, were obtained in tasteless, colorless silky needles, readily soluble in alcohol, ether and chloroform, less soluble in benzin, insoluble in boiling water or solution of potassa. When heated on platinum foil they fused, and burned with a smoky flame. Gently heated on paper the substance fuses to a transparent resinous mass, which dissolved in alcohol, and can be obtained in crystals on evaporation of the solution. From these reactions it was considered to be a crystallizable resin.

The remainder of the extract, after treating with benzin, was repeatedly washed with ether; the ether evaporated, and the residue dissolved in a little alcohol and poured into water, which precipitated a soft brown somewhat acrid resin, soluble in alcohol, ether and chloroform; insoluble in benzin, and but sparingly soluble in solution of potassa.

The undissolved portion of the extract was treated with water, which almost entirely dissolved it, leaving a tasteless residue. The aqueous solution was mixed with calcined magnesia, and carefully evaporated to dryness, and exhausted by repeated boiling with alcohol, which on evaporation left a bitter yellowish mass. This was dissolved in water and solution of tannin added, as long as a precipitate was produced, which was collected, washed with a little water mixed with oxide of lead, and carefully dried. This was treated with boiling alcohol, and the liquid found to be free from bitter taste, and to leave no residue on evaporation. A portion of the precipitate which had been treated with alcohol, was mixed with water, solution of acetate of lead added, and boiled for a few minutes and filtered. The filtrate, after removing the lead by sulphuretted hydrogen, filtering, and evaporating to a small bulk, was free from bitter taste; the bitter principle appearing to have been entirely lost.

The drug which had been previously exhausted with alcohol, was next percolated with water and yielded a very bitter infusion, which was evaporated to a small bulk and poured into alcohol, which precipitated a considerable amount of gum. After separating the gum, most of the alcohol was recovered by distillation, and the residue mixed with magnesia, and evaporated on a water-bath to dryness. This was then washed with successive portions of alcohol, until the washings ceased to have a bitter taste, and the washings evaporated. The residue was dissolved in water, and found to contain a small amount of tannin, which was removed by solution of subacetate of lead. The lead was

removed with sulphuretted hydrogen and the filtrate, after boiling, allowed to stand for some time in contact with animal charcoal, which absorbed the bitter principle.

The animal charcoal was then thrown on a filter and washed with cold water to remove sugar, which was found to be present by Trommer's test, and was obtained in an uncrystallizable condition on the evaporation of the washings. The residue on the filter was then dried and exhausted with hot alcohol, which on evaporation yielded a yellowish mass, having an intensely bitter taste; soluble in alcohol and water, but insoluble in benzin, ether and chloroform. With concentrated nitric acid it produces a bright red color, which slowly fades to yellow. Sulphuric acid gives a purplish-brown coloration. Molybdate of ammonium, dissolved in sulphuric acid, produces a purple color with tinge of brown, changing to red, then orange, and finally pale yellow. Its aqueous solution yielded precipitates with the following reagents: With solution of iodohydragryate of potassium, yellowish-white; with mercuric chloride, white; with platinic chloride, yellowish-white; with iodine, in solution of potassium iodide, orange, and with solution of tannin, greyish-white. From the above reactions the bitter principle of the bark was considered to be an alkaloid.

A portion of the bark by distillation with water yielded a trace of volatile oil, enough of which could not be obtained for examination.

Five grams of the bark were incinerated and yielded sixty-two centigrams of ash, equal to twelve and two-fifths per cent., of which twenty per cent. was soluble in water, and eighty per cent. soluble in hydrochloric acid. An analysis showed the presence of potassium, calcium, and magnesium, existing as chlorides, carbonates and phosphates.

TESTS FOR ARSENIC.

BY PHIL. HOGLAN, PH.G.

In a recent trial of a woman in Coshocton county, for administering arsenic to her husband, who died August 13th, 1879, with all the symptoms of arsenical poisoning, the toxicologist, who made an examination of the viscera of the deceased and found four-fifths of a grain of arsenic in the liver, and traces in the stomach and intestines, used Reinsch's and Marsh's tests, and proved the metallic spot on porcelain, produced in Marsh's test to be arsenic by the hypochlorite of sodium and the nitrate of silver tests, and the production of octahedral crystals in

Reinsch's test, as distinguishing arsenic from antimony. The cross-examiner read from a work on jurisprudence, that the hypochlorite of sodium test was wholly unreliable, *as it would also dissolve the antimonial spot*, though more slowly. This is in direct conflict with the U. S. Dispensatory, p. 34, fourteenth edition. Query: Which is correct? The production of octahedral crystals, which is considered so characteristic of the arsenical sublimate, was shown to be unreliable from a recent statement of Prof. Wormley's, that antimony, under certain conditions, *will produce octahedral crystals, which cannot be distinguished in appearance from those of arsenic*. This seems to destroy a distinguishing test for arsenic, hitherto considered as one of the most delicate and reliable. If antimony does act like arsenic under certain conditions, perhaps the "Journal" can give those conditions. The toxicologist should know what they are. The woman was acquitted, and we have no doubt, the fact that subnitrate of bismuth had been prescribed for the deceased had its weight with the jury. The arsenic might have been an impurity in the subnitrate of bismuth. Lesson: Every druggist should test his bismuth preparations and be sure of the absence of arsenic.

Newcomerstown, O., March 19th, 1879.

NOTE BY THE EDITOR.—It is to be regretted that the author does not give the alleged authority for the solubility of antimony in hypochlorite of sodium. Taylor (On Poisons) states that "a solution of chloride of lime does not dissolve the antimonial deposit." Dragendorff (Ermittelung von Giften) and Schwanert (Pharmaceutische Chemie) state that the antimonial spots are insoluble in hypochlorite of sodium, which is free from uncombined chlorine. Dragendorff calls this test an excellent (vortrefflich) one and recommends preparing the solution by decomposing chlorinated lime with carbonate of sodium.

Regarding the production of octahedral crystals from antimony, Prof. Wormley has kindly sent us a reprint of his paper "Fallacies of Reinsch's test for arsenic," which appeared in the "Amer. Journal of the Medical Sciences" for October, 1877. It will be observed from this paper, which we reproduce in full as far as it relates to this subject, that while it is possible to obtain from an antimony deposit octahedral crystals, which in themselves are not to be distinguished from those obtained from arsenic, yet the general character of the antimony

sublimate differs widely from that produced from arsenic. We quote from Prof. Wormley's paper as follows :

The statements in regard to the behavior of the antimony deposit, however, have been somewhat discordant. Thus, by some writers, it is stated that this metal fails to yield any sublimate whatever; by others, that it yields an amorphous sublimate; and by others still, that the deposit is either amorphous or granular. According to Professor W. A. Miller, however, the antimony deposit, when heated, "gradually becomes oxidized, and at a higher temperature the oxide is volatilized, condensing in needles; not, like arsenic, in octahedra." "Elements of Chemistry," ii, p. 602.

This statement of Professor Miller was strongly urged a few years since in a somewhat noted trial as evidence of the *absence* of antimony, since on the application of the copper test there was a failure to obtain crystalline needles. Immediately after this trial, in 1872, we very carefully examined this test in regard to the character of the sublimate produced by antimony. In over fifty consecutive experiments of this kind, in which copper, pretty heavily coated with antimony, but used in small portions at a time, was employed, we failed to obtain well-defined crystalline needles, except in some three or four instances in which a few needles were observed, and in one in which the sublimate consisted largely of large groups of prismatic needles with single prisms.

But, what is of more importance in a forensic point of view, we found that the sublimate produced from antimony might contain *octahedral crystals* of antimonious oxide, and that under certain conditions it was almost sure to contain such crystals. In a number of instances sublimes were obtained, which, when examined under the microscope, presented fields which, taken alone, could not be distinguished from an arsenical sublimate by the most experienced eye.

These octahedral crystals are more likely to form when the heat is applied very gradually, and especially when the reduction-tube is relatively large to the quantity of deposit submitted to sublimation. In no instances were octahedral crystals obtained when a very narrow or contracted tube was employed. It would thus appear that for the production of crystals, antimony required a more free supply of air than arsenic, although the absolute quantity of oxygen required is less.

Although it is thus possible to obtain from antimony sublimes, certain portions of which, under the microscope, are not to be distinguished from the results obtained from arsenic, yet there is considerable difference in the general behavior of these metals under the action of this test.

1. The antimony deposit requires a much higher temperature to volatilize it, vaporizing at little, if any, below a dull red heat; whereas, according to recent investigations, metallic arsenic volatilizes at about 356°F., or, according to Professor Guy, even so low, when in small quantity, as 230°F.

2. The position of the sublimate in the reduction-tube, as usually obtained, may serve at once to distinguish the antimonial from the arsenical deposit. In the case of antimony, on account of its less volatility, the lower margin of the sublimate (in which the crystals, when present, are found) is only slightly in advance of the slip of copper, or the sublimate may even form on the sides of the tube surrounding the copper, especially when the heat is restricted to the lower end of the tube; whilst, as is well known, in the case of arsenic the sublimate usually forms half an inch or more in advance of the copper foil.

3. The general appearance of the sublimate under the microscope, even when octahedral crystals are present, usually differs very greatly from that obtained from arsenic, the octahedra being confined to the lower margin of the sublimate, and many more appearing opaque than in the case of that metal, and there being many granular and opaque points interspersed among the crystals. Moreover, only a single field, or at most a very small portion of the sublimate will present crystals, the other portions being either wholly amorphous, or at most granular.

As is well known, the arsenical sublimate, as usually obtained, consists wholly of octahedral crystals, which gradually diminish in size from the lower portion of the sublimate to the upper margin, where, under a low power of the microscope, they may appear as mere points; which, however, under a higher power of the instrument, will be found to be perfect octahedra.

In a large series of experiments, after the manner in which this test is ordinarily applied for the detection of arsenic, we in no instance obtained from antimony a sublimate that could not readily be distinguished from a pure arsenical deposit; yet it must be borne in mind that, under certain conditions, it is possible to obtain from antimony a sublimate consisting largely, if not wholly, of octahedral crystals, and presenting to the naked eye the sparkling appearance usually presented by the arsenical sublimate. In the instance already mentioned, in which large groups of prismatic needles were obtained, very many octahedra were interspersed among the prisms.

From the foregoing statements it is obvious that the mere production of octahedral crystals by this test is not, in itself, conclusive proof of the presence of arsenic. When examining this test in the preparation of the *Micro-Chemistry of Poisons*, we in a few instances observed minute octahedra, which at the time were attributed to the presence of a trace of arsenic in the antimony compound employed. The entire absence of that metal in the present experiments was fully established.

We also find that the deposit of metallic antimony formed in the exit tube of a Marsh apparatus by decomposing antimonuretted hydrogen by heat, may, when the tube is detached and the deposit again heated, be in part at least converted into octahedral crystals of the oxide.

If pure antimonious oxide be vaporized in a small tube, the sublimate usually contains octahedral crystals, but sometimes crystalline needles. According to our experiments, octahedra are much more likely to be present than needles; the opposite result, however, is stated by several writers.

Our experience has confirmed the observation first made by Mitcherlich, that when a solution of tartar emetic is decomposed by excess of ammonia, the precipitated antimonious oxide is after a time converted, in part at least, into minute octahedra.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER.

Inorganic Chemistry.—*On Vesbium, a New Element.*—A. Scacchi has communicated to the Academy of Sciences, of Naples, the result of an investigation of the green and yellow incrustations which coat the Vesuvian lava of 1631 in numerous fissures. These coatings con-

sist of silicates containing copper, lead, and a body which Scacchi considers to be new, and which he calls *Vesbium*, from the old name of Vesuvius. As yet only a few tests have been made with it. He considers it as existing in the form of a metallic acid, of reddish color, which yields colorless salts with the alkalies, and these, on the addition of an acid, become yellow. The silver salt is red or yellowish-red, the copper salt yellowish-green. Hydrogen sulphide gives a brown precipitate and a bluish liquid, becoming brown on the addition of zinc. Salt of phosphorus gives a yellow bead in the outer flame and a green bead in the inner flame. Scacchi does not consider molybdenum or vanadium to be present, although Rammelsberg, who reports the announcement to the Berlin Chemical Society, thinks these properties point to the presence of the latter element.—*Berichte der Chem. Gesell.*, xiii, p. 250.

Properties of Norwegium, a recently announced New Element.—Dahll, the discoverer of this element (this journal, 1879, p. 447), communicates the following as to its properties: It is white, not very malleable, has a specific gravity 9.44, fuses at near 350°C ., and dissolves in nitric acid with blue color, which on dilution becomes green. The reduction of its brown oxide in hydrogen gave as the amount of oxygen present 9.6 and 10.15 per cent. On the supposition that the formula of the oxide is NgO , the atomic weight of Ng would be 150.6 or 141.6. The solutions are precipitated by alkalies, with green color, the precipitate dissolving, however, in excess of alkali, with blue color. Hydrogen sulphide gives a brown precipitate, insoluble in alkaline sulphides. Zinc reduces the sulphate solution, producing at first a brown coloration, and on boiling yielding the metal. Before the blowpipe a yellow glass is obtained, which becomes blue on cooling, and treatment with soda or charcoal yields a yellowish-green incrustation.—*Ibid*.

Organic Chemistry.—*A Contribution to Knowledge of Protein Substances.*—A. Stutzer makes the announcement of his discovery of a method for the quantitative separation of albuminoids from other nitrogenous substances occurring in plants. He finds that the hydrated cupric oxide, recommended for the precipitation of dissolved protein matters, can be used for the separation of these protein materials from nitrogenous substances such as amygdalin, solanin, leucin, tyrosin, asparagin, from alkaloids, mustard-oils, nitrates and ammonia salts. All the protein materials studied by him can be classified according to the action of acid gastric juice (pepsin and hydrochloric acid) upon them, into two groups of bodies. There are formed, on the one hand, the

known decomposition products of albuminoids, the soluble peptones, acid albuminates, etc., and on the other hand a portion, of definite amount, remains completely indigestible. This last appears to contain phosphorus as well as nitrogen.—*Ibid.*, p. 251.

On Hyoscyamina.—Ladenburg has followed up his study of the *tropéins*, or artificial alkaloids, lately described (this journal, March, 1880, p. 148), by a more specific study of this natural alkaloid. Its close physiological relationship to atropia seemed to make this very important. The alkaloid on treatment with barium hydrate is decomposed, in a manner analogous to that observed with atropia, into hyoscinic acid and a base hyoscina. The analyses of both of these decomposition-products give figures identical with those gotten from tropic acid and tropin, the products of the decomposition of atropia by barium hydrate. The fusing-points and other physical characters also agree. Ladenburg says that three explanations only are possible of the certainly established difference between atropia and hyoscyamia: 1st, the hyoscinic acid may be different from tropic acid; 2d, hyoscin may differ from tropin; or, 3d, the decomposition products of the two alkaloids may be identical, but the component parts of the two natural substances may be differently united, so that their isomerism may be of a character analogous to that existing between oil of gaultheria and methyl-salicylate. The author thinks that his study of the "tropeins" from the two bases will enable him to settle the question of identity.—*Ibid.*, p. 254.

On Duboisina.—This alkaloid, which comes from the Australian plant *Duboisia myoporoides*, has already taken an important place among the remedies of eye-clinics; for, although similar to atropia in action, it is capable of use under circumstances where this latter is forbidden. Ladenburg has proved the complete identity of the purified alkaloid with hyoscyamia. He establishes this by an analysis of both the gold salt and the purified alkaloid itself. The following reactions, moreover, hold true of both alkaloids. The addition of picric acid to the dilute hydrochloric acid solution gives a yellow oil, which solidifies almost immediately to beautiful and regular plates; platinic chloride produces no precipitate; iodine in iodide of potassium solution produces at once a separation of a crystalline periodide; tannic acid produces a slight turbidity; double iodide of potassium and mercury produces a white amorphous precipitate.—*Ibid.*, p. 257.

Technical and Applied Chemistry.—*Fire-proofing Materials and*

Mixtures.—The following mixtures for rendering textile fabrics, paper, straw, etc., fire-proof, form the basis of a recent English patent, issued to Martin and Tessier, in Paris :

No. 1.	Pure ammonium sulphate,	8	kilograms
	Carbonate of ammonium,	2.5	
	Boracic acid,	3	
	Pure borax,	1.7	
	Starch,	2	
	Water,	100	

The articles are to be dipped into the boiling solution.

No. 2.	Boracic acid,	5	kilograms
	Sal ammoniac,	15	
	Potassium feldspar,	5	
	Gelatin,	1.5	
	Flour paste,	50	
	Water,	100	

This is to be applied to wood, theatre accessories, etc., with a brush.
 —*Chemische Industrie*, Jan., 1880, p. 25.

Separation of Fats and Resins from Soaps.—This is effected, according to J. Wolff, by the use of commercial anilin, which, by conversion into the hydrochlorate, filtration of the aqueous solution through moistened filters, precipitation with caustic soda and removal of the salt, is freed from any admixture of benzol or nitro benzol. The product so obtained is distilled, and only the part boiling over 180°C. used. This will dissolve fats and resins in the cold, but will not dissolve soaps. The mixture to be treated is gotten into a finely-divided condition and then treated with 10 to 20 volumes of anilin, while the mixture is stirred and any hard lumps are broken. After one-half to three-quarters of an hour digestion on the water-bath it is allowed to cool and then filtered. The filtrate is treated with an excess of hydrochloric acid and then with three to four parts of water. The cold solution is then shaken up with ether and the etherial layer removed. This, on evaporation, leaves the fats and resins of the original mixture. —*Ibid.*, p. 28.

Manufacture of Carbon Disulphide.—The following interesting description is of the manufacture of carbon disulphide as carried out on a large scale by M. Deiss at Marseilles, France. Four vertical fire-clay retorts, 1.8 meter in height and 0.4 meter in diameter, are placed together in an oven and are filled with charcoal. When this has been brought to a glow, crude powdered sulphur is introduced by means of a fire-clay tube reaching down to beneath the double bottom of the

retorts. This tube, after each charging, is stopped with a ball of plastic clay. The escaping bisulphide vapors pass through wide sheet-iron tubes into large closed iron receivers, which are cooled from the exterior and have an exit tube for the uncondensed vapors. These pass into a second receiving chamber, which is provided with partition walls, and a circulation of the vapors is thus brought about, so that further condensation takes place. The uncondensed vapors then pass through water and out into the chimney. Each retort yields 100 kilograms carbon disulphide per 24 hours, and of the sulphur used 90 per cent. is converted into disulphide. The product is shipped in iron casks of different sizes and special directions for emptying these are sent with them. The present price is 40 francs per 100 kilograms. The current production is 1,200,000 kilograms annually, but a considerable enlargement of the works is under way.—*Ibid.*, p. 8.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

Mercurial Ointment (see "*Amer. Jour. Pharm.*," March, 1880, p. 138 to 142).—Dieterich states, as an addition to his numerous experiments, that the ointment may also be prepared readily without using old ointment, or any other addition, by first extinguishing a minute quantity of the mercury with the lard, and then adding, very slowly and gradually, larger quantities of the mercury. This method proved so successful that the author thinks it ought to be made officinal. He also endeavored to utilize Collier's method of separating mercury into minute particles with tincture of quillaia (see "*Amer. Jour. Pharm.*," Jan., 1880, p. 41), but was unsuccessful, the metal running together again as soon as an endeavor is made to mix with the lard.—*Pharm. Centralb.*, Jan. 29, 1880, p. 39.

Extinction of Mercury with Soft Paraffin.—Dr. E. Weber corroborates Godeffroy's, and contradicts E. Dieterich's statements in regard to the use of vaselin for extinguishing mercury (see "*Amer. Jour. Pharm.*," March, 1880, p. 141). He prepared 1,500 grams of dark and uniformly colored ointment in less than one-half hour. He first triturated 500 grams of mercury with 160 grams of vaselin for five minutes, when globules of mercury were no longer visible either with the naked eye or by means of a magnifier, and then added gradually the almost cool mixture of 280 grams of suet and 560 grams of lard.—*Pharm. Ztg.*, Feb. 7, 1880, p. 79.

American Nostrums.—Hager gives the following as the composition of the nostrums advertised as Dr. August Kœnig's family medicines.

Hamburg breast tea is a mixture of marshmallow root, licorice root, red poppy petals, mallow flowers, marshmallow flowers, flowers of a stellaria, colored by saffron, and coarsely powdered rock candy, flavored with the oils of anise and fennel.

Hamburg drops are similar to the well-known elixir of life or Swedish bitters, but contain more white agaric, and are rendered thicker by the addition of inspissated juice of juniper berries.

St. Jacob's oil is a good oil of turpentine, to which a small quantity of oil of rosemary and oil of lavender has been added, and tinged light red with alkanet or red saunders.—*Pharm. Centralb.*, Jan. 29, 1880, p. 42.

Globuli Peptici, Dinner Globules or Dinner Pills.

R Cinchonidiæ sulphatis,	5'0
Pepsini,	30'0
Pulveris zingiberis,	
Pulv. pimentæ,	
Pulv. cardamomi,	āā 3'0
Pulv. gentianæ,	
Pulv. althææ,	
Pulv. tragacanthæ	āā 6'0
Mix, and add a mixture of glycerinæ,	10'0
Acidi muriatici,	
Aquæ,	āā 6'0

Mix into a pilular mass; divide into 300 or 360 globules; dry gradually, and coat with sugar or any other good coating.

Dose, 1 or 2 pills (globules) to children, and from 4 to 6 to adults. These pills are warmly recommended by Hager for assisting digestion after a hearty meal.—*Ibid.*, Jan. 29, 1880, p. 37.

The *Cinchona Alkaloids* exist in the bark of the stem of *Cinchona succirubra*, according to Dr. J. E. De Vrij, as cinchotannates, and may be partially extracted by cold water under the influence of a soluble acid or acid compound existing in the bark. Practically not more than three-sevenths of the total alkaloids can be thus removed, the remaining four-sevenths being, however, readily taken up with dilute hydrochloric acid. The author's investigations show that the cinchotannates of the alkaloids, which rotate polarized light towards the right, are more soluble than those of the alkaloids, which rotate towards the left. The author makes—

Extractum Cinchonæ liquidum by mixing the powdered cinchona bark into a thin paste with water, adding sufficient normal hydrochloric acid (the quantity required is calculated from the known percentage of alkaloids in the bark used), transferring to a percolator, percolating with water and evaporating the percolate until the weight of the residue equals that of the bark used. De Vrij considers that quantity of hydrochloric acid sufficient which transforms the alkaloids present in the bark into acid hydrochlorates, readily soluble in water; the cinchotannic acid is of course set free and dissolves in the water. As basis for his calculations he assumes that 320 grams of mixed alkaloids require 73 grams of anhydrous hydrochloric acid. The normal hydrochloric acid of the author is a liquid containing 36.5 grams HCl in a liter.

Extractum Cinchonæ solidum is made like the fluid extract, except that the evaporation is continued until the extract has the proper consistence.—*Archiv d. Pharm.*, Jan., 1880, p. 34, from *Haaxmann's Tydschr. voor Pharm.*

Chinoidin is, according to Burdel, even superior to quinia as a remedy for malarial fever and quartan ague, and only has less efficacy than quinia in the treatment of acute intermittent fever. Hager modifies this statement; he admits that chinoidin, if pure, is very efficacious as an antifebrile remedy and stomachic, but regards it as inferior to quinia as a tonic. He recommends the use of the other cheap cinchona alkaloids, because the appearance and other properties of chinoidin greatly encourage and facilitate adulteration, the detection of which is often comparatively difficult.¹ Hager found chinoidin in doses of 1.0 to 1.5 gram, combined with an acid, a mild and painless but effective purgative, which does not apparently weaken the body.—*Pharm. Centralb.*, Feb. 5, 1880, p. 49.

Quebracho Bark (see also "*Amer. Jour. Pharm.*," 1879, p. 192, 309, 472, 554, 557, and Feb., 1880, p. 92).—O. Primke was informed by Dr. Hieronymus, who is connected with the university at Cordoba, Argentine Republic, that the wood and bark of the following four trees appear in commerce as quebracho.

I. *Aspidosperma quebracho*, *Schlechtendahl*, N. O. Apocynaceæ, common name, Quebracho blanco. This tree grows in the province of Catamarca and is used by the natives for malaria and asthma.

¹ The possibility of adulteration is scarcely sufficient reason for discarding the use of a valuable remedy, which has the additional recommendation of cheapness.—
EDITOR.

2. *Loxopterygium* (*Quebratschia*) *Lorentzii*,[†] *Grisebach*, N. O. *Terebinthaceæ*, common name, *Quebracho colorado*. The wood and bark are used for tanning purposes; the tree grows particularly in the province of *Corrientes*.

3. *Iodina rhombifolia*, *Hooker et Arnot*, N. O. *Aquifoliaceæ*, common name, *Quebracho flojo*. Wood and bark are often mixed with that of No. 2.

4. *Machærium fertile*, *Grisebach*, N. O. *Leguminosæ Dalbergiææ* syn. *Tipoana speciosa*, common name, *Tipa*. This tree also yields wood and bark for tanning purposes, both of which possess less value than No. 2.—*Pharm. Ztg.*, Jan. 31, 1880, p. 64.

Extract and Tincture of Quebracho.—The "*Journ. des Connaiss. Medic.*" recently published a formula for so-called quebracho extract, according to which the quebracho bark is exhausted by digesting for eight days with alcohol, when the liquid is evaporated to dryness, the residue dissolved in water, the filtered liquid again evaporated, and ultimately the residue is dissolved in sufficient water to obtain a preparation having double the weight of the bark used. This preparation is of one-half the strength of the fluid extracts of the United States. Dr. *Vulpus* considers it a poorly-prepared tincture, which will not keep, and is sold at a price fifteen times as high as the original bark. The following formulas are considered to yield far superior preparations:

I. *Tinctura Quebracho spiritiosa*.—Quebracho wood, 100·0; alcohol and distilled water, of each 225·0. After digesting for eight days, express and filter.

II. *Tinctura Quebracho aquosa*.—A convenient quantity of rasped quebracho wood is extracted on a steam-bath twice successively with 10 times its weight of water; the mixed extractions are allowed to settle, strained and evaporated to the consistence of a thick extract, when sufficient water is added to make the total weight equal to the weight of the wood used. After allowing to stand in a cellar for a few days, the liquid is filtered, and sufficient cold water is added through the filter to make the weight of the filtrate again equal to the weight of the wood used. Both of these tinctures have a handsome red color, a strong, bitter, astringent taste, and keep well.—*Ibid.*, Feb. 4, 1880, p. 70.

Jaborandi leaves have again been carefully investigated by *F. Miller* and *F. Budee*. The so-called genuine (*Pernambuco*) *jaborandi* of Dr. *Coutinho* consists of the leaves of a *Pilocarpus*, probably of *P. pinatifolius* and *P. selloanus*. The stems ought to be removed because

they contain no, or very little, pilocarpina, the active principle. The leaves of a plant belonging to nat. ord. Piperaceæ, probably *Piper lætum*, appear in the market as Brazilian jaborandi. Budee endeavored, but was not able, to isolate an alkaloid from this plant. Those leaves of Pernambuco jaborandi, the lower side of which is hairy, are more efficacious, *i. e.*, contain more alkaloid, than those that are not. The percentage of impure alkaloid amounts to almost 1 per cent. of the leaves, and the percentage of the pure nitrates obtainable varies between 0.3 and 0.7 per cent.

Pure pilocarpina is a thick, oily, light yellow liquid; the nitrate is white and light; the chloride deliquesces and decomposes readily.

Pilocarpus pinnatifolius grows in Brazil, principally in the provinces of Mattogrosso, Piauha, Ceará and St. Paulo. *P. selloanus* is indigenous to Southern Brazil and Paraguay, and principally enters commerce by way of Rio de Janeiro. *Piper lætum* also grows in Brazil, in the vicinity of Rio de Janeiro.—*Archiv d. Pharm.*, Jan., 1880, p. 1427.

Adulterated Fennel.—During the past winter much of the fennel met with in the German market was adulterated with previously-extracted fennel. On account of the unfavorable weather but little fennel of handsome appearance was harvested, and as most of it possesses such a poor color the addition of previously-extracted fruit is apt to escape observation.—*Pharm. Ztg.*, Feb. 7, 1880, p. 80.

Volatile Alkaloid in *Aethusa Cynapium*.—By distilling the contused fruit of this plant with milk of lime, W. Bernhardt obtained a reddish-yellow liquid, floating like oil on the aqueous distillate. Both this oily liquid in alcoholic solution and the aqueous distillate possessed a strongly alkaline reaction, and an exceedingly penetrating, offensive odor, resembling the odor of rancid fish-oil. The author considers the oily substance a volatile alkaloid, the formation of which is analogous to that of trimethylamin from *Chenopodium vulvaria*, when treated similarly. He intends to further investigate its nature.

Ficus first discovered this alkaloid, called it "Cynapin," and alleges to have obtained it in crystals, while Walz described an alkaloid very similar to that found by Bernhardt.—*Archiv d. Pharm.*, Feb., 1880, p. 117.

Coloring Matters of Grapes and of Huckleberries (*Vaccinium myrtillus*, Lin.).—The extensive investigations made by A. Andrée show that:

1. The natural blue coloring matter of grapes never varies.

2. It is not altered by fermentation, but is dissolved in the alcoholic acidulous liquid, the color being changed to red.

3. The grapes grown in Southern France contain more coloring matter than is necessary to give the wines a very dark color.

4. The shade of color is no criterion for the quality of wines.

5. The color will not serve to distinguish fermented grape-juice from the fermented juice of huckleberries.

6. Young wines always have a bright colored foam.

7. The coloring matter of wine is a mild acid, which will combine with lead oxide, and this compound is again destroyed by acids.

8. The addition of ammonia changes the red natural color of wines to blue, and if used in excess, or too concentrated, destroys the coloring principle altogether. The blue color produced by ammonia is the original natural coloring matter of the grapes, restored by neutralizing the acid which had turned it red.

9. Old wines usually yield a green reaction with ammonia.

10. The juice of fresh as well as of old huckleberries has the same behavior towards ammonia as young and old wines.

11. The coloring principle of grapes is identical with that of huckleberries.

12. The coloring principle is not altered by age, the varying reactions of old and fresh juice being caused by other circumstances, the exact nature of which will be further investigated by the author.—*Ibid.*, Feb. 1880, p. 90-112.

Canadian Castor.—Three sacs, having the well-known characteristic external appearance, were examined by Ed. Janota. Two of them possessed all the properties of genuine Canadian castor, while the third did not possess the peculiar odor of castor, and consisted of fibres, and a large quantity of hair, thoroughly saturated with a reddish-brown sticky fluid. A fraudulent adulteration seeming impossible in the closed sac, and improbable even if possible, because a heavier substance, less readily detected, would in such a case have been substituted in the sac for the removed castor, the author came to the conclusion that the altered condition of the contents was due to a diseased condition of the living animal.—*Pharm. Post*, Feb. 1, 1880, p. 48.

Poisoning by Carbolic Acid.—A midwife was recently sentenced to two months' imprisonment at Frankfort for causing the death of a child, by applying liquid carbolic acid, containing 88 per cent. of the

acid, to an open sore. The child immediately fell asleep, and died a few hours later.—*Pharm. Ztg.*, Feb. 7, 1880, p. 78.

As an Antidote for Carbolic Acid Intoxication, caused by continued external application of a 5 per cent. solution of the acid, Sonneberg recommends sodium sulphate, 5 to 8 grams of which he administered in 200 grams of water to adults, and 2 to 5 grams in 200 grams of water to children. The urine is at first dark green, and has a slightly brownish tint, but soon acquires again its normal color, when the carbolic acid application may be continued.—*Ztschr. d. Allg. Oest. Apoth. Ver.*, Jan. 20, 1880, p. 43, from *Apoth. Ztg.*

Arsenic in the Animal Organism.—In contradiction to Sclösuboff's statements, Prof. E. Ludwig claims as the result of numerous chemical analyses made by him, that in chronic as well as in acute arsenical poisoning the quantity of arsenic traceable in the brain is very minute, while much larger (frequently 90 times as large) quantities are found in the liver; and he therefore recommends the liver, and in cases of acute poisoning, the kidneys, as the portions of the body most suitable for legal chemical investigations.—*Pharm. Post*, Jan. 16, 1880, p. 25.

PREPARATION AND PROPERTIES OF PURE EMETIA.

BY DR. PODWYSSOTZKI.

(Translated and abridged from "*Pharm. Ztschr. f. Russl.*," 1880, p. 1-8, by LOUIS VON COTZHAUSEN, Ph.G.)

I. PREPARATION.—Either one of the two following methods yields satisfactory results:

1st method.—Treat the powdered ipecacuanha first with ether and then with petroleum benzin, in order to remove the liquid oil, the white fatty or waxy matter and those coloring matters which are soluble in the solvents named,¹ then extract the powdered root two or three times successively, at a moderate heat, with 85 per cent. alcohol, without adding any acid; evaporate the mixed tinctures to a syrupy consistence, add after cooling a very concentrated solution of as much ferric chloride as corresponds to from 10 to 13 per cent. of the weight of the powdered ipecac used, mix the mass well, add sodium carbonate in excess, boil the mass in a flask on a water-bath with successive small portions of

¹ Some ipecacuanhas, yielding much emetia, contain a principle soluble in ether, crystallizing in straw yellow needles and forming with barium hydrate and with alkalies purple compounds; the principle might be called *erythrocephalein*.

petroleum benzin (in which the emetia dissolves), shaking frequently, and continue to use fresh portions of the menstruum until no more emetia goes into solution; the filtered benzin solutions are mixed, and, if concentrated, the mixture is allowed to stand for twelve hours in a very cool place, when almost all of the emetia will separate pure as a white precipitate. If, however, the mixture is not very concentrated, atmospheric air is blown through it for some time, when pure emetia will separate in white flakes. By concentrating or evaporating the benzin solution, however slowly, pure white emetia is *never* obtained. The emetia should be collected quickly on a filter and dried over sulphuric acid.

2d method.—The first method may be modified by triturating the powdered ipecac into a thick paste with a little hydrochloric acid, adding sufficient ferric chloride and sodium carbonate, allowing to stand for some time, extracting successively with fresh portions of ether, and shaking the mixed ethereal solutions with a small quantity of water, acidulated with acetic, sulphuric or hydrochloric acid, when the emetia goes into an acid solution, which after the addition of soda in excess is boiled successively with petroleum benzin, etc., as in the first method. The best kinds of ipecacuanha yield from three-quarters to one per cent. of pure emetia; inferior kinds only one-quarter or one-half per cent.

II. PROPERTIES.—Pure emetia, thus prepared, is readily soluble in cold ether, chloroform, acetic ether, amylic, methylic and ethylic alcohol, carbon bisulphide, in ordinary alcohol of any strength, oil of turpentine, volatile oils, and, to a great extent, in olive oil, other fats, and in oleic acid; it is scarcely soluble in cold, readily in hot petroleum benzin, and is still less soluble in cold water, 1,000 parts of which very slowly dissolve but 1 part emetia. From ether, petroleum naphtha, fatty oils and from similar liquids, which are scarcely or not at all soluble in water, it is separated by acids. Its taste and that of its compounds is very bitter. When exposed to light and air it soon turns yellow, but it remains white when protected from the light. On very slowly evaporating its solutions in ether or alcohol, emetia is deposited in thin agglutinating scales, but if the solutions are rapidly evaporated, it is separated in fine uniform granules. It melts at 62° to $65^{\circ}\text{C}.$, has a strong alkaline reaction, and is neutralized by acids forming salts, which on evaporation in vacuo form brilliant colorless irregular crystals; when evaporated in the air the salts remain as a dry yellow resin-like

mass. The salts are readily soluble in water, alcohol and fatty oils, and are insoluble in ether, petroleum naphtha, benzol, etc. With tannic acid emetia forms an amorphous white pulverulent precipitate, almost insoluble in water; its compounds with gallic and other acids are readily soluble in water. All salts soon become yellow when exposed to light, except the tannate, which remains unaltered. When treated with concentrated sulphuric (nitric? EDIT.) acid, emetia yields oxalic acid, as has been observed by former authors; when treated with dilute sulphuric acid in a closed tube for three hours at 150°C. it is transformed partially into a blackish brown, not bitter, substance, and partially remains unaltered. With all reagents for alkaloids emetia yields amorphous precipitates. Concentrated sulphuric acid, poured on pure emetia does not alter it. One drop of a freshly prepared solution of sodium phosphomolybdate in concentrated sulphuric acid, when added to a small particle of emetia, colors it brown; this color is immediately changed to an intense indigo color on the addition of one drop of concentrated hydrochloric acid.

OSTRICH AND OTHER PEPSINS.

By I. R. JAMES.

At a meeting of the School of Pharmacy Students' Association (London), held Feb. 12, the author read a paper on the above subject, in which he alluded to the attention attracted by the pepsin obtained from the stomach of the South American ostrich, *Rhea americana* and *Rhea Darwinii*. After giving a brief history of these birds the author refers to ingluvin prepared from the gizzard of the chicken, and which has been said to be superior to pepsin as a remedy for feeble, painful and imperfect digestion. Obtaining some of this preparation from the agents, the following experiments were made:

Fresh eggs were kept in boiling water for one hour and then allowed to get quite cold; after depriving them of their shells the whites were cut into the thinnest possible slices—not minced, as it is easier to observe the progress of the digestion of albumen if it be sliced than if it be minced—and care was taken to reject any portion of yolk. Fifty grains of coagulated albumen thus prepared was placed in each wide-mouthed bottle and covered with 5 drachms of distilled water containing 1 per cent. of hydrochloric acid, sp. gr. 1.16. The quantity of pepsin was then weighed out and added to the mixture of albumen and

dilute hydrochloric acid. The bottles and their contents were then placed in a water-bath and kept at a temperature of 98° to 102°F. for four hours, when digestion was regarded as complete.

Kind of pepsin employed.	Weight of pepsin employed.	Results.
Pig pepsin, . . .	$\frac{1}{2}$ grain . . .	Digested
Ostrich pepsin, . . .	$2\frac{1}{2}$ grains . . .	Not digested.
" " . . .	5 " . . .	" "
" " . . .	10 ¹ " . . .	" "
Ingluvin, . . .	$2\frac{1}{2}$ " . . .	" "
" . . .	5 " . . .	" "
" . . .	10 ¹ " . . .	" "

From the results detailed in the foregoing table, and contained in the bottles shown, it will be seen that the albumen is scarcely acted upon at all, and that both ostrich pepsin and ingluvin are practically destitute of the power of digestion.

We know how dominant ideas exercise a powerful effect on the bodily functions. Dr. Carpenter says, "A strong direction of the inward consciousness to any part, especially if attended with an expectation of something being about to happen, is quite sufficient to change the physical action of a part." If the South American Indians' imagination were similarly appealed to, it might be they would derive the extraordinary benefit attributed to ostrich pepsin after partaking of 7 or 8 pounds of beef, which, on the authority of Dr. Symes, they are in the habit of indulging in.

We have heard of late a great deal about elevating the position of pharmacists and chemists and druggists generally. As a step in this direction, and believing as I do that the examination of new remedies is a duty which we owe to medical men, I would suggest that we pay more attention to the testing of substances purporting to be remedial agents which from time to time find their way into our pharmacies and are prominently brought before the notice of practitioners; for it is a matter of considerable importance that the accuracy of facts be well sustained before they are given to the profession, many of whom have no facilities for verifying them. If any of you wish to work in this direction, lest you should think, after excluding the above-named winged animals, that pepsin can only be obtained from the stomachs of pigs, calves and sheep, I have much pleasure in placing before you other kinds. I am indebted to Mr. Lloyd Bullock for the samples of

Finding that twenty times as much ostrich pepsin and ingluvin had so little effect, I did not think it necessary to pursue the experiments further.

pepsins shown, which I have found to possess considerable digestive activity, although inferior in this respect to the pepsin of the pig. One of the specimens is unique of its kind, viz.: pepsin from a human stomach, which I need hardly say is not intended for medicinal use.

In the stomach of the river crayfish is found a plentiful supply of a yellowish-brown, feebly acid juice, which possesses an energetic fermenting power and rapidly dissolves fibrin, but the *addition* of a few drops of a dilute hydrochloric acid solution stops the action. Also, a somewhat similar ferment to pepsin, discovered by Fick and Murisier in the stomachs of frogs, pikes and trout, differs from it (pepsin) in being more active at a low temperature, as at 20°F., while it loses its digestive power at the temperature of the blood (96° to 98°F.)—*Phar. Jour. and Trans.*, Feb. 21, 1880, p. 662.

A METHOD for the PROXIMATE ANALYSIS of PLANTS.

BY HENRY B. PARSONS.¹

At the request of my friend and former instructor, Prof. Albert B. Prescott, of the University of Michigan, I have prepared the following scheme for the analysis of plants. This method will appear in substance in his new "*Proximate Organic Analysis*," now nearly completed.

The plan submitted is the outgrowth of a quite varied experience in the proximate analysis of plants; no claim to originality is made, the sole aim being to arrange in one simple scheme those methods best suited to insure accuracy.

It must be premised that no one method is applicable in all cases, and that the operator will so modify and adapt the proposed processes as to best attain the truths he seeks. If the present scheme shall serve merely as an example, to be improved upon as discoveries multiply, it will at least have served to stimulate to the more thorough study, this side the Atlantic, of a much neglected, yet very important, branch of analysis. The American student, when first entering upon the study of plant analysis, is perplexed and disheartened, owing to the lack of any elementary treatise in which he may find directions for the quantitative estimation of the various plant constituents. The works of Rochleder and Wittstein, while giving most valuable assistance in the investigation of special constituents and their separation from large quantities of the crude herb, still fail to give clear and practicable directions for the quantitative estimation of each constituent. Von Mueller's latest enlarged edition of Wittstein's "*Plant Analysis*" gives a scheme, most excellent in many respects, yet cumbered with tiresome methods of extraction and manipulation, which serve to unnecessarily lengthen the time required for making the analyses without increasing the accuracy of results obtained.

Too many American analyses of plants have been summarized thus: "The plant contains gum, resin, tannin, a volatile oil and a peculiar bitter principle, to which may be ascribed its medicinal activity." The foreign journals bring occasionally

¹ Reprint from "*American Chemical Journal*," vol. I, No. 6. Communicated by the author.

most excellent examples of accurate examinations of vegetable substances; as instances may be cited, the examination of ginger, by J. C. Thresh,¹ and of ergot,² aloes,³ and other articles by Prof. Dragendorff. To these sources the student must look for his best models until a more thorough and systematic training is given American students in proximate organic analysis.

In following the plan now presented, the use of the apparatus for repercolation is strongly urged for the extractions with benzol, alcohol and other volatile solvents. A very simple and inexpensive apparatus has been described by various American and foreign chemists.⁴

"In any convenient water-tight vessel is a worm of block-tin pipe, having an internal diameter of 9 mm., and a length of about 2.5 meters. The lower (external) part of this worm is fitted by an ether soaked velvet cork to a glass percolator, having a diameter of 4 cm., a length of 20 cm. to the constriction, and 5 cm. below. Within this percolator is a smaller tube, flanged at the top and bottom, and suspended by fine platinum or copper wires. This tube has a diameter of 2.5 to 2.8 cm., and a length of 14 cm.; the bottom is covered by filter paper and fine washed linen,⁵ tied on by linen thread. The weighed sample of the finely powdered herb is placed within this tube for extraction. A light glass flask, weighing about 30 grams, is fitted by an ether-soaked cork to the outer percolator." Having introduced the solvent into this glass flask the connections are made secure, and heat is applied by a water-bath to the flask. If the liquid is too slowly volatilized the addition of a little common salt to the water in the bath serves to remove the trouble.

Next in importance is the use of a good tared filter. The form originally presented by F. A. Gooch⁶ leaves little to be desired. It may be made by perforating with fine holes the bottom of an ordinary platinum crucible, and fitting it accurately to a perforation made in a large rubber cork; this cork connects it with a receiving vessel, which in turn is connected with a Bunsen's pump. Fine asbestos suspended in water is poured into the crucible, the air exhausted from the receiving vessel, and thus a firm, thin layer of asbestos is deposited on the bottom of the crucible. After ignition and weighing the crucible is ready for the reception of any precipitate which it is desired to separate and weigh.

The use of these two pieces of apparatus will eliminate two grave sources of error, viz., incomplete extraction of soluble matters, and inaccuracies introduced by the use of tared paper filters.

The other necessary apparatus is simple, and includes one or more platinum crucibles and evaporating dishes, accurate burettes and graduated cylinders, a good

¹ "Phar. Jour. Trans." [3], 10, 81, Aug., 1879. "Am. Jour. Phar.," 1879, p. 519.

² "Phar. Jour. Trans." [3], 6, 1001, June 17, 1876. "Am. Jour. Phar.," 1876, p. 413; 1878, p. 335.

³ "Werthbestimmung," 1874, p. 110.

⁴ B. Tollens, "Zeitsch. f. Anal. Chem." [17], 320, 1878; "New Remedies" [7], 335, Nov., 1878; W. O. Attwater, "Proc. Am. Chem. Soc." [2], 2, p. 85; S. W. Johnson, "Am. Jour. Sci. Arts" [13], 196; H. B. Parsons, "New Remedies" [8], 293, Oct., 1879.

⁵ In place of the linen and filter paper may be substituted fine brass or platinum wire gauze. Asbestos suspended in water may then be poured in to form a fine felt. The tube can then be dried and weighed, and the amounts extracted may be found by the loss of weight of the tube and substance. A little experimentation will show the operator how to prepare and use the tube. It is but an adaptation of the Gooch's Filter here recommended.

⁶ "Proc. Amer. Acad. Sci." [13], p. 342, 1878; "New Remedies" [7], p. 200, Oct., 1878; "Am. Chem. Journ.," p. 1, 317.

balance, sensitive to at least .5 milligram, and the ordinary glass and porcelain-ware found in all laboratories.

It is assumed that whoever attempts the analysis of a plant is informed as to the normal constituents to be sought, that he has had considerable experience in inorganic analysis, and in the identification of the principal classes of proximate constituents, which he now undertakes to estimate quantitatively. Accordingly, tests for identification will not be here presented; they should, however, never be omitted. The necessity of recording in detail all physical and chemical peculiarities with every weight that is taken is self-evident.

A METHOD FOR THE PROXIMATE ANALYSIS OF PLANTS.

I. *Preparation of Sample.*

The air-dry specimen should be carefully examined, and all extraneous substances removed. The entire sample should then be ground, or beaten in an iron mortar, until it will all pass through a sieve having from 40 to 60 meshes to the linear inch. After thoroughly mixing this sample, take of it about 100 grams, which should be further pulverized until it will all pass through a sieve having from 80 to 100 meshes to the linear inch. From this smaller portion remove all iron, derived from mill or mortar, by use of a magnet. Then place in a clean, dry bottle, which should be labeled and securely corked. This small sample is for the analysis; the larger portion should be reserved for the separation of those proximate principles which seem, from the analysis, to be worthy of more extended investigation.

II. *Estimation of Moisture.*

Dry rapidly, at 100 to 120°C., two or more grams of the sample; the loss of weight equals moisture and occasionally a little volatile oil. In some cases it is best to dry at a lower temperature, and at other times the drying should be conducted in a stream of hydrogen or carbonic anhydride.

III. *Estimation of Ash.*

In a weighed crucible gently ignite two or more grams of the sample until nearly or quite free from carbonaceous matter; the heat should not be permitted to rise above faint redness, or loss of alkaline chlorides may occur. Weigh this residue as *crude ash*, and in it determine:

a. Amount Soluble in Water.—This portion may contain chlorides, sulphates, phosphates and carbonates of potassium and sodium; also slight amounts of chlorides and sulphates of calcium and magnesium.

b. Insoluble in Water; Soluble in Dilute Hydrochloric Acid.—The residue from *a* should be treated with a slight excess of hydrochloric acid, and evaporated in a porcelain dish over a water bath until all free acid has been expelled; it should then be again moistened with hydrochloric acid, water added, and be filtered from any remaining insoluble substances. This treatment removes carbonates (with decomposition) and phosphates of calcium and magnesium, sulphate of calcium and oxides of iron and manganese.

c. Insoluble in Water; Insoluble in Dilute Hydrochloric Acid; Soluble in concentrated Sodid Hydrate.—Boil the residue from *b* with a solution containing about twenty per cent. of sodid hydrate. This treatment removes combined silica of the ash. The residue still insoluble is sand and clay which adhered to the specimen; this residue should be separated, washed thoroughly, and weighed.

Always determine the amounts removed by the above treatment by weighing the dried, undissolved residues. The ash, as thus estimated, usually includes a little unconsumed carbon, together with more or less carbonic anhydride (CO_2), most, or all, of which was not originally present in the plant, but was produced by the combustion of the organic matter. For most purposes it is unnecessary to estimate and exclude from the ash this carbonic anhydride; where great accuracy is desired, a complete quantitative analysis should be made, the amount of each base and acid being determined, and in the statement of results only those should be included which existed originally in the plant. For this purpose it is necessary to burn from twenty to one hundred grams of the sample; for further directions consult textbooks on agricultural and inorganic analysis.

IV. *Estimation of Total Nitrogen.*

In half a gram or more of the sample determine total nitrogen by combustion with excess of soda-lime, as directed by Prof. S. W. Johnson and E. H. Jenkins. If later in the analysis no other nitrogenous substances are discovered, calculate the total amount of nitrogen to albuminoids by multiplying by 6.25. When other nitrogenous compounds are present, their content of nitrogen should be determined directly or by difference; after proper deductions have been made, the remaining nitrogen should be calculated to albuminoids.

V. *Estimation of Benzol Extract.*

In a suitable apparatus for repercolation completely exhaust five grams of the sample with pure coal-tar benzol (sp. gr. 85—88, boils at 80 to 85°C., leaves no residue when evaporated). The extraction requires from four to six hours' continued action of the solvent. Carefully evaporate this liquid to dryness in a weighed dish, and record its weight as *total benzol extract*. This extract may contain volatile oils and other aromatic compounds, resins, camphors, volatile or non-volatile organic acids, wax, solid fats, fixed oils, chlorophyll, other colors, volatile or fixed alkaloids, glucosides, almost no ash.

To the weighed extract add water, again evaporate on the water-bath, and complete the drying in an air-bath at 110°C. In absence of other vaporizable substances the loss of weight approximates the amount of *volatile oil*. If the presence of a volatile alkaloid is suspected (from a characteristic odor or an alkaline reaction), add a drop of hydrochloric acid to prevent its volatilization. Camphors are partially dissipated by this treatment; hence, when they are present, this evaporation should be dispensed with.

Treat, now, the residue with a moderate amount of warm water, allow to stand until cool, then filter through fine paper by aid of a Bunsen's pump. In half of the aqueous filtrate determine *total organic matter* and *ash*; test the remaining half for *alkaloids*, *glucosides* and *organic acids* by salts of lead, silver, barium and calcium. Care must be taken not to mistake a slight amount of suspended matter, frequently resinous, for other substances actually soluble in water.

The still undissolved residue should be again removed from filters and dishes by solution in benzole, the benzole solution being again evaporated to dryness. Treat this residue with warm, very dilute hydrochloric acid, allow to cool, and filter

¹ "Report Conn. Agric. Exp. Station," 1878; "Chem. News," July 18, 1879, p. 28; "Amer. Chem. Journal," 1, p. 77.

through paper. The filtrate should be tested for *alkaloids* and *glucosides*. The amount extracted by acid, if any, may be determined by weighing the still undissolved residue. Treat this residue with several considerable portions of eighty per cent. alcohol (sp. gr. .8483 at 15.6°C.), allowing at least an hour for each treatment. Filter through paper and determine by evaporation the matter dissolved; this usually consists of *chlorophyll* with one or more *resins*, which may sometimes be separated by use of petroleum naphtha, chloroform or similar solvents. Purified animal charcoal removes *chlorophyll* and *some resins* from alcoholic solution, while certain other resins are not removed. If *camphors* were present in the plant, the greater portion will be found in the alcoholic liquid.

The substances undissolved by eighty per cent. alcohol may be *fixed oil*, *solid fat*, *wax*, and very rarely a *resin*: their separation may be attempted by refrigeration and pressure, or by use of ether, chloroform, etc.

Recapitulation.

1. Loss by evaporation, with precautions: *volatile oil*.
2. Soluble in water: *alkaloids*, *glucosides*, *organic acids*.
3. { Soluble in water.
Soluble in dilute acids. } : *Alkaloids*, possibly *glucosides*.
4. { Insoluble in water;
Insoluble in acids.
Soluble in 80 per cent. alcohol. } : *a.* { Removed by animal charcoal:
chlorophyll, *some resins*.
b. { Not removed by animal charcoal: *some resins*.
5. { Insoluble in water.
Insoluble in dilute acids.
Insoluble in 80 per cent. alcohol. } : *wax*, *fats*, *fixed oils*.

It is frequently advantageous to extract the plant with petroleum naphtha (sp. gr. 66 to .70, boils at about 50°C., wholly volatile) before treatment with benzol; by reference to the accompanying table of comparative solubilities it will be seen that this treatment may serve to separate fixed and volatile oils, and some resins and colors, from certain solid fats, wax, other resins and colors.

Where benzol of sufficient purity cannot be had, pure chloroform is the best substitute. The use of ether is objectionable in this place, as its solvent properties are less distinctly marked than are those of naphtha, chloroform and benzol; in other words, more plant constituents are sparingly soluble in ether than in the above mentioned solvents. Consequently many substances which should properly be extracted by 80 per cent. alcohol will be sparingly dissolved if ether were used, while benzol, chloroform and naphtha would have no perceptible solvent action upon them; tannic acids may be cited as instances illustrating this point.

VI. Estimation of eighty per cent. Alcohol Extract.

That part of the plant not dissolved by benzol should be dried at 100°C., and then completely exhausted by 80 per cent. alcohol (sp. gr. .8483 at 15.6°C.). This requires from 12 to 14 hours' continuous treatment with the solvent. Remove, dry, and weigh any crystals or powder that may separate upon concentrating and cooling the alcoholic percolate. Make the clear liquid to a definite volume by adding more 80 per cent. alcohol. In an aliquot part of this liquid determine *total organic matter* and *ash*; in another equal portion determine *total organic matter* and *ash* soluble in water, and, by difference, *total organic matter insoluble in water*.

The remaining clear alcoholic liquid should be evaporated carefully to dryness,

TABLE OF COMPARATIVE SOLUBILITIES.

Substances.	Water.	Absolute Alcohol.	80 per ct. Alcohol.	Ab. Ether.	Chloroform.	Benzol.	Pet. Naph.	Ammonia.	Ammonic Cupric Oxide.	H ₂ SO ₄ . Sp. gr. 1.78.	Fehling's Sol.	Lead Subacetate.
Volatile oils,	Sp	Sol	Sol	Sol	Sol	Sol	Sol	Sol	.	.	.	.
Fixed oils,	Ins	Ins?	Ins	Sol	Sol	Sol	Sol	Ins?	.	.	.	.
Wax,	Ins	Sp	Sp	Sp	Sp	Sol	Sp?	Ins?	.	.	.	.
Solid fats,	Ins	Sp	Sp	Sp?	Sp?	Sol?	Sp?	Ins?	.	.	.	.
Chlorophyll,	Ins	Sol	Sol	Sol	Sol	Sol	Sp	Ins	.	.	.	.
Soft resins,	Ins	Sol	Sol	Sol	Sol	Sol	Sol	Ins?	.	.	.	.
Hard resins,	Ins	Sol?	Sol	Sol?	Sol?	Sol?	Sol?	Sol?	.	.	.	.
Glucose,	Sol	Ins	Sp	Ins	Ins	Ins	Ins	Sol	.	Reduced	Not prec	Not prec
Sucrose,	Sol	Ins	Sp	Ins	Ins	Ins	Ins	Sol	.	Not reduced ²	Not prec	Not prec
Tannin,	Sol	Sol	Sol	Sp	Ins	Ins	Ins	Sol	.	Reduced	Prec	Prec
Glucosides,	Sol?	Sol?	Sol?	Sol?	Sol?	Sol?	Sol?	Sol?	.	Reduced ²	Not prec	Not prec
Alkaloids,	Sol?	Sol?	Sol?	Sol?	Sol?	Sol?	Sol?	Sol?	.	.	.	.
Albuminoids,	Sol?	Sol?	Sol?	Ins	Ins	Ins	Ins	Ins?	.	.	.	.
Gums,	Sol	Ins	Ins	Ins	Ins	Ins	Ins	Sol?	.	Not reduced	Prec	Prec
Pectin,	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Sol?	.	.	.	.
Pectic acid,	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Sol	.	.	.	.
Organic acids,	Sol?	Sol?	Sol	Ins?	Ins?	Ins?	Ins?	Sol	.	.	.	Prec?
Salts of org. acids,	Sol?	Sol?	Sol?	Ins?	Ins?	Ins?	Ins?	Sol?	.	.	.	Prec?
Starch,	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Ins	.	.	.	.
Cellulose,	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Sol	Sol	.	.
"Para cellulose,"	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Ins ¹	Sol	.	.
"Meta cellulose,"	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Sol	.	.
"Vasculose,"	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Ins	Ins	.	.
"Extractives,"	Sol	Ins?	Sol?	Ins	Ins	Ins	Ins	Ins?	.	.	Reduced?	Not prec?
Colors	Sol?	Ins?	Sol?	Ins	Ins	Ins	Ins	Sol?	.	.	.	Prec?

¹ "Para cellulose" soluble in ammonia-cupric oxide after boiling with dilute HCl.

² Glucosides reduce Fehling's solution after boiling with dilute acids; same with sucrose.

An ? show that some marked variations or exceptions occur.

Sp = sparingly soluble. Sol = soluble. Ins = insoluble.

pulverized and treated with several considerable portions of absolute alcohol (sp. gr. .7938 at 15°C.).

A. SOLUBLE IN ABSOLUTE ALCOHOL.

a. Soluble in water.

a¹. Precipitated by subacetate of lead.

Tannin and most organic acids; some extractives; some inorganic acids of the ash. Weigh in Gooch's filter, ignite cautiously, and again weigh; loss equals organic matter precipitated.

a². Not precipitated by subacetate of lead.

Alkaloids, glucosides, some extractives and colors. Determine by difference between *a* and *a¹*.

b. Insoluble in water.

b¹. Soluble in dilute hydrochloric acid.

Alkaloids, glucosides (rarely), some extractives. Determine by difference between *b* and *b²*.

b². Insoluble in dilute hydrochloric acid.

b³. Soluble in dilute ammoniac hydrate.

Most acid resins, some colors. Determine by difference between *b²* and *b⁴*.

b⁴. Insoluble in dilute ammoniac hydrate.

Neutral resins, some colors, albuminoids (in some seeds). Re-dissolve in alcohol, evaporate and weigh.

B. INSOLUBLE IN ABSOLUTE ALCOHOL.

c. Soluble in water.

c¹. Precipitated by subacetate of lead.

Some colors, extractives, albuminoids (rarely), organic acids, and inorganic acids of the ash. Weigh in Gooch's filter, ignite cautiously, and again weigh; loss equals organic matter precipitated.

c². Not precipitated by subacetate of lead.

Alkaloids, glucosides, glucose, sucrose, some extractives. Determine by difference between *c* and *c¹*. Remove Pb by H₂S, H₂SO₄, Na₂CO₃, or other means, and titrate for sucrose and glucose.

d. Insoluble in water.

d¹. Soluble in dilute hydrochloric acid.

Some alkaloids and glucosides. Determine by difference between *d* and *d²*.

d². Insoluble in dilute hydrochloric acid.

Few resins, some extractives and color substances. Dissolve in alcohol, evaporate and weigh in a tared dish.

In some cases it may be preferable to use the following method for analysis of the 80 per cent. alcohol extract; it is more desirable when the plant examined contains a considerable amount of sugars, tannic acid, etc.

Alcohol Extract, dilute to 200 cc. with 80 per cent. alcohol.

1. In 20 cc. determine *total organic matter* and *ash*.

2. In 20 cc. determine *total organic matter* and *ash* that are *soluble in water*, and, by difference, *total organic matter insoluble in water*.

3. Evaporate the remaining 160 cc. to dryness, treat with water, filter, and make the filtrate measure 160 cc. Reserve the insoluble matter on the filter for examination (10).

4. In 20 cc. of the aqueous solution determine tannin gravimetrically by A. Carpeni's method;¹ precipitate by ammoniacal acetate of zinc, use a Gooch's filter, wash the precipitate with very weak ammonia, dry at 120°C., weigh, ignite cautiously, again weigh. The loss by ignition equals tannic acid, in absence of certain interfering substances.

5. Precipitate 20 cc. by normal acetate of lead, and determine, as before described, the amount of organic matter after drying at 100 to 120°C. This precipitate will contain, if the substances are present in the plant, *tannic, gallic*, and most other *organic acids*, some *colors*, rarely *albuminous substances*, some *extractives*, and most *inorganic acids* of the ash. Determine, by difference, the amount not precipitated by this treatment.

6. In 20 cc. determine in like manner the amount precipitated by basic acetate ("subacetate") of lead. This reagent precipitates a greater number of acids, colors and extractives than are precipitated by the normal acetate, hence it is frequently possible to estimate such substances by subtracting the amount precipitated by one reagent from the amount precipitated by the other. To the filtrate add a slight excess of dilute hydrochloric acid, boil gently for half an hour, and determine in the liquid *total glucose* by use of Fehling's solution.

7. Precipitate 20 cc. by subacetate, exactly as in 6, and use the precipitate as a duplicate to check the amount there estimated. To the filtrate add a very slight excess of solution of carbonate of sodium, filter from the carbonate of lead, wash well with water containing a little alcohol, and in the filtrate estimate *actual glucose*. If the glucose thus found is appreciably less than that in 6, subtract it from that amount; this glucose may be due to the presence in the plant of *sucrose* or some *glucoside*. If due to *sucrose*, the amount of the latter may be found by multiplying this residual glucose by .95; if to a *glucoside*, a fit subject for an extended investigation is presented. The properties, formula and decomposition products of the newly-found glucoside should be carefully studied.

8. Precipitate 20 cc. with subacetate of lead, as in 6 and 7, employing the precipitate as material from which to separate organic acids, after removal of lead by sulphuretted hydrogen. Acidulate the filtrate with sulphuric acid, add an equal volume of alcohol, allow to stand two hours, filter, wash the precipitate with 50 per cent. alcohol, and evaporate the filtrate until all alcohol has been dissipated. Test the acid solution for *alkaloids, glucosides, sugars, extractives*.

9. Reserve the remaining 40 cc. for duplicating any unsatisfactory determinations.

10. The residue mentioned in 3 as insoluble in water may contain *resins, albuminoids* (especially from seeds), *colors, alkaloids, glucosides*. Dilute acids remove *alkaloids* and some *glucosides*; dilute ammoniac hydrate will remove some *resins, colors* and *glucosides*. Any still insoluble residue probably contains *albuminous* or *resinous* substances.

VII. Estimation of Cold Water Extract.

That part of the plant remaining insoluble after treatment with alcohol should be dried at 110°C., and completely extracted by cold water. When the plant contains considerable mucilaginous matter this is best removed by placing the sub-

¹"Chem. News," July 9, 1875, p. 19, from "Gaz. Chim. Ital.," 1875, No. 3; "Proc. Am. Ph. Asso.," 1875, p. 341. See also "Amer. Jour. Phar.," 1876, p. 219.

stance in a flask or graduated cylinder, and then adding a measured volume of cold water. Allow to macerate, with frequent agitation, for from 6 to 12 hours, then filter through fine washed linen, and evaporate an aliquot portion of the solution. In this residue determine *total organic matter* and *ash*. This residue usually contains little but *gum*; in analysis of fruits and fleshy roots *pectin bodies*, *salts of organic acids*, rarely a substance resembling *dextrin*, and small amounts of *albuminous substances* and *coloring matter*. Usually the separation of these substances is very difficult. The unevaporated liquid should be used for such qualitative reactions as are necessary to show the nature of the substances extracted. The insoluble residue should be well washed with water, transferred to a crucible, and completely dried at 110°C . This residue should be then weighed.

VIII. Estimation of Acid Extracts.

The dried residue insoluble in cold water should be transferred to a beaker containing 500 cc. of water and 5 cc. of concentrated sulphuric acid (sp. gr. 1.84). Boil for 6 hours, on a gauze support, adding water to keep the volume of liquid unchanged; if the substance be very starchy a longer boiling may be necessary. This treatment will convert *starch* and its *amorphous isomers* to dextro glucose, and will occasionally remove some *salt of an organic acid*, with usually traces of *albuminous* and *indeterminate* substances.

The *total amount extracted* may be found by washing, drying at 110°C ., and weighing the yet insoluble residue, and subtracting the weight from the one taken after extracting with cold water. The amount of *starch and isomers* may be found by determining in a given volume of the acid filtrate the amount of *glucose*, using Fehling's solution; the glucose thus found multiplied by .9 equals starch and isomers. The *total extract* minus *starch and isomers* equals *acid extract not starch*. This includes a small amount of *ash*, which may be approximately determined by evaporating and igniting a known volume of the solution.

Where it is wished to separate the extracted matter from the sulphuric acid, boil the liquid with an excess of powdered barium carbonate until no acid reaction remains. Filter and evaporate to dryness. The residue consists chiefly of hydrated dextro glucose ($\text{C}_6\text{H}_{12}\text{O}_6 \cdot \text{H}_2\text{O}$), with some ash.

IX. Estimation of Alkali Extract.

Wash well and dry at 110°C . the residue from treatment with acid, and record its weight. Boil this residue for two hours with 500 cc. of a solution containing 20 grams of sodic hydrate to the liter. Filter through fine washed linen, and wash the residue thoroughly with hot water, alcohol and ether. Transfer it to a weighed crucible, dry at 110 to 120°C ., and weigh the residue as *crude fibre* and *ash*; this weight subtracted from the previous one shows the *total alkali extract*. This extract is largely *albuminous matter* and various modifications of *pectic acid*, Fremy's "*cutose*," and various *coloring*, *humus* and *decomposition compounds* in small amounts. Most of the extracted substances may be precipitated by excess of an acid with or without the presence of alcohol.

X. Cellulose.

The crude fibre from IX should be treated with from 50 to 100 c. c. of U. S. P solution of chlorinated soda and allowed to stand twenty-four hours. If not then bleached white, slightly acidulate with hydrochloric acid and set aside for another

day. Filter through fine linen, or Gooch's filter, wash with hot water, dry at 110 to 120°C., and weigh, ash free, as *cellulose*. The loss of weight by this treatment state as *lignose* and *color*.

Remarks.

It is advisable to determine always, in addition to what has already been directed, the amounts extracted directly from the sample by water, ether, alcohol of various percentages, methylic alcohol, naphtha, chloroform, carbon disulphide, etc. In each extract estimate *total organic matter* and *ash*, determine qualitatively, and quantitatively when possible, its constituents, by treating with such solvents and reagents as are indicated. Each extract being composed of certain distinct substances, it is necessary to account for them in every case.

The amounts present of some constituents may be found by subtracting the weight extracted by some one solvent from the weight extracted by some other. It will be seen that this is a method of limited applicability, which can only be applied in those cases where the difference between the solvent action of the two liquids is very sharply defined. Certain special methods for the estimation of single constituents may be used, care being taken that all interfering substances be first removed. The methods of preparation of known substances as given in Husemann's "*Pflanzenstoffe*," and to a considerable extent in Watt's Dictionary, may serve as suggestions for work. Treatment with benzol, eighty per cent. alcohol, and water, removes from nearly all plants the constituents of greatest chemical and medicinal interest, but in analyses of grains, fodder and food materials those compounds extracted by dilute acids and alkalis have great value. There are substances in plants, seemingly isomers of starch and cellulose, which have properties more or less resembling those of cellulose, and are changed by boiling with dilute acids to glucose. In absence of an established nomenclature it has seemed best to use the terms "*starch isomers*," or "*amylaceous cellulose*" for these substances,¹ while those constituents, *not albuminous*, which are removed by dilute alkali have been termed "*alkali extract*." These substances have been investigated by various chemists, but no definite and authoritative nomenclature has yet been adopted. Thomsen gives the name "*holz-gummi*,"² *wood gum*, to a white substance extracted from plants by dilute sodic hydrate, while Fremy regards these various compounds as modifications of pectic acid, pectin, and "*cellulose bodies*."³ Starch also may exist in some seeds (as of sweet corn) in a form soluble in water.⁴

It will be seen that the field for investigation is limitless, and almost unoccupied as yet, and that there is great need for improved methods for proximate analysis. The analyst will find that a study of any common plant will require of him much more than unthinking, mechanical habits of manipulation, while every careful investigation will reveal to him some constituents deserving more full and accurate study.

¹ U. S. Dept. of Agric. Report, 1878, p. 189.

² Kolbe's "*Jour. prak. Chem.*" Band 19, p. 146.

³ "*Compt. Rend.*" lxxxiii, 1136; "*Jour. Chem. Soc.*" 1877, p. 229.

⁴ U. S. Dept. of Agric. Report, 1878, pp. 153-155.

VARIETIES.

Poison for Rats and Mice.—A mixture of 1 part precipitated barium carbonate, 3 parts barley flour and sufficient water to make a mass, is rolled into pills, having the size of beans. These are said to be fully as efficacious as phosphorus pills, and are decidedly cheaper.—*Pharm. Ztschr. f. Russel.*, 1879, p. 631, from *Drog. Ztg.*

A preparation for poisoning parasites on animals and plants, patented by J. Wilson, is made by melting 50 parts tallow, or another cheaper fat, and 25 parts rosin, adding 50 parts crude soda and 25 parts borax, boiling with water, adding 75 parts carbolic acid and 30 parts calcium sulphide solution, and finally 80 parts extract of tobacco. The inventor thinks that this mixture forms sulphoglycerol-carbolate of nicotin.—*Ber. d. Deutsch. Chem. Ges.*, 1879, p. 2195.

Water Proof Leather.—A preparation for this purpose, patented by J. A. Rosa, of Paris, consists of a solution of ordinary rosin, or another resin, in turpentine, petroleum ether, etc.—*Ibid.*, p. 2194.

Carbolic varnish, suitable for spreading on damp walls, and also on wood; for the purpose of preserving it, is made by dissolving, in an iron kettle, 100 parts borax and 50 parts caustic soda in 4,000 parts water, heating to the boiling point, gradually adding 450 parts shellac, stirring constantly, and, after cooling or when lukewarm, adding 200 parts 90 to 95 per cent. pure carbolic acid. This varnish is applied lukewarm, and is frequently diluted with one-third its bulk of hot water.—*Pharm. Centralb.*, Dec. 11, 1879, p. 463.

An excellent paint for damp walls, highly recommended by D. Johannsen, consists of rosin, boiled linseed oil and oil of turpentine, each 5 parts, and white chalk 15 parts.—*Pharm. Ztg.*, 1879, p. 625.

Sulpho-Methylate of Sodium.—**A New Purgative.**—M. Rabuteau has investigated a new purgative, analogous to sulpho-vinate of sodium. It is obtained by treating methyl alcohol with sulphuric acid, when methyl-sulphuric acid and water are obtained. This product is neutralized with carbonate of barium, when the excess of sulphuric acid is thrown down in the insoluble form of barium sulphate, and there remains in solution sulpho-methylate of barium, a substance which is very soluble, and which can be crystallized. It is then treated afresh with sulphuric acid, which liberates pure sulpho-methylic acid, which yields sulpho-methylate of sodium when neutralized with soda. The salt is white and very soluble, crystallizing with difficulty, of a feeble taste comparable to that possessed by sulpho-vinate of sodium, with a sweet after-taste. Unfortunately it decomposes very rapidly into sulphate of sodium and methylic products of a slightly garlic-like odor. Ten grams of the salt in 25 cc. of water injected into the veins of a dog produced constipation. Acting upon the observation that the substance when introduced into the blood gave rise to constipa-

tion, M. Rabuteau believed that it should act as a dialytic purgative when given by the mouth. He therefore administered it to two patients; in one case a woman took 15 grams in two doses, when it produced three stools, of which two were copious in the second a man took 18 grams, resulting in two stools without colic. The taste of the purgative is hardly perceptible, but it is difficult to preserve it.—*Chicago Med. Jour. and Exam.*, March, 1880.

Thymolin Soap is a soap designed especially for the antiseptic cleansing of physicians' instruments. The soap contains a sufficient quantity of the disinfectant, and the odor of the thymolin is by no means unpleasant. In this day when so much is said respecting the transmission of disease by surgical instruments it will be a satisfaction to make use of an agent in cleansing them, which will at least assist in their disinfection.—*Chicago Medical Jour. and Exam.*—*Virginia Med Monthly*, Dec, 1879.

Eucalyptus.—In the Italian Medical Gazette R. Rudolph reports eucalyptus as a specific for acute coryza, and declares that chewing the twigs and swallowing saliva secreted will result in rapid relief. His experience includes experiments upon his patients and upon himself. It is probable that the fluid extract would be equally efficacious.—*Chicago Med. Gazette*, Feb. 20, 1880.

Paper Pulp from Poplar Wood.—The Worcester "Spy" says: It surprises people to see the great logs of poplar wood go through the powerful machine at the Connecticut river pulp mill at Holyoke. The wood as it is brought to the mill is about the size of cord wood used for fuel, and in this shape the machine takes it and gnaws it up very fine. So rapidly does this process go that the machine eats about seven and a half cords of wood a day, and this makes between three and four tons of pulp. After coming from the machine the wood is put into vats and reduced by the action of chemicals. It is used for the manufacture of news and book paper, and pulp made from spruce wood, which has more fibre than poplar, is sometimes used in the cheaper grades of writing paper. Spruce is harder to reduce to pulp than poplar, and but little of it is used. The poplar trees in this vicinity have long since given out, and the wood is now mostly brought from Canada.—*Gaillard's Med. Journ.*, Feb., 1880.

Jamaica Dogwood (*Piscidia erythrina*), is recommended in the "Pharmaceutical Journal" as a powerful narcotic, capable of producing sleep and relieving pain in an extraordinary manner. It has been used as an anodyne in toothache, curing the pain when introduced upon a dossil of cotton into the carious tooth. In Brazil it has an established reputation as a nervous sedative. Its action seems to be over the nerve centers; it causes sleep without producing the cerebral hyperæmia which succeeds opium and the active principles extracted therefrom. The sleep is tranquil and refreshing; it soothes bronchial cough and moderates the paroxysm of asthma and nervous coughs. It has been used with success in chronic hepatitis and obstructions of the liver.

The idiosyncrasies encountered in many cases in regard to the action of opium and its alkaloids compel the profession to seek an anodyne and hypnotic in other agents

We think this remedy worthy of a trial. The fluid extract is used in doses of five drops.—*Buffalo Med. Journ.*—*Nashville Journ. of Med. and Surg.*, Feb., 1880.

Hard versus Soft Water.—Dr. Tidy, the well-known chemist, thus summarizes in the London "Medical Examiner" the results of his observations on the use of hard water for culinary and domestic purposes:

1. Hard water is the best dietetically, because of the lime.
2. It makes better tea, although not so dark colored, owing to the fact that soft water dissolves the bitter extractive matters which color the tea, but ruins the aroma.
3. It relieves thirst, which soft water does not.
4. It does not dissolve lead or organic matter, which soft water does.
5. It is generally good colored, soft water being as a rule dark colored and unpleasant looking; hence in places like Manchester, supplied with soft water, they always put it (in hotels) in dark bottles to hide the color. A soft water, however, is a better detergent and requires less soap. For a residential town a water which has over ten degrees of hardness would be best. For a manufacturing town a soft water would be the most advisable for commercial considerations only.—*Pharmacist*.

A Plea for Oleomargarin as a Food Product.—Representatives of the oleomargarin industry appeared before the House Committee on Agriculture and Manufactures on March 10th, in opposition to any legislation injuriously affecting their product. They claim that oleomargarin is identified with butter; that both the real butter and oleomargarin butter are simply animal fat, and the difference in the process of manufacture makes no difference in the substance. They stated that the factory in New York is now making 40,000 pounds of oleomargarin butter per day, and that there are eleven such factories in Baltimore, Louisville, Chicago and other cities; that the exports of oleomargarin oils from the port of New York alone amounts to 5,000 tierces per month. They protest against any discriminating legislation on the ground that their product is a general food-product, pure and wholesome in itself, and a fit substitute for butter.—*New York Med. Record*, March 20, 1880.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, March 18th, 1880.

In consequence of the fifty-ninth annual commencement of the College occurring on the third Tuesday of this month, the Pharmaceutical Meeting was postponed to Thursday, the 18th inst.

The meeting was called to order by Dillwyn Parrish, the President; the minutes of the last meeting having been read, were approved.

Donations to the cabinet and library being the first business in order, the Registrar presented and described the advantages of a lozenge apparatus, designed by Mr. Francis E. Harrison, of the graduating class of this year. It will be figured in the May number of the "Journal."

The Registrar presented to the library, on behalf of Mr. George W. Gray, a graduate of the class of 1877-78, a copy of the Pharmacopœia of St. Thomas Hospital, London, dated 1781, for which the College returned their thanks. The recent additions to the library were shown, consisting mainly of serial publications, received in exchange for the "American Journal of Pharmacy," and of several works bearing upon the sciences closely related to pharmacy.

Mr. Gaillard exhibited a very handsome specimen of the sweet cassava root (*Janiþba Manihot*), a native of Brazil, but now acclimated in Florida; when boiled it furnishes a good substitute for the potato; a very beautiful starch can be prepared from it by the usual method, and a very fine article of glucose can be obtained by boiling with dilute sulphuric acid.

Professor Maisch presented to the cabinet and exhibited samples of *soft paraffin*, sold under the name of petrolina and made by the Binghamton oil refining company, of Binghamton, N. Y. It is of a uniform consistence, free from odor, and appears to be composed entirely of paraffins melting at about the same temperature. The thanks of the meeting were returned to the donors for their gift.

Mr. J. U. Lloyd, of Cincinnati, lately sent samples of the root of *Anemopsis Californica*, Hooker, to Professor Maisch, which he exhibited. A singular peculiarity was pointed out, that a number of underground stems, of same species of grass, had completely grown through the root, sometimes transversely, sometimes diagonally and sometimes longitudinally. The root is possessed of a good deal of pungency and yields a large proportion of volatile oil, which gives a blue color with hydrochloric acid, this being the only known volatile oil exhibiting this reaction; several other products of the root, described by Mr. Lloyd in the January number of the "Journal," p. 4-6, accompanied the oil. An investigation of the medical properties of the root is being made.

A specimen of *sclerotic acid* was shown by Professor Maisch; this acid was discovered by Professor Dragendorff and is considered the most efficient principle in ergot; it has been used with considerable success in the hospitals of Russia and Germany.

A number of the *botanical plates*, published by Dr. Dodel-Port, of Zurich, Switzerland, were exhibited by Professor Maisch, who stated that these handsomely executed plates are admirably adapted for illustrating lectures on botany.

There being no further business, the meeting adjourned.

T. S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Philadelphia College of Pharmacy.—The examination of the *Junior Class* was held on the afternoon and evening of February 14th. The following were the questions:

MATERIA MEDICA AND BOTANY.

1. What kind of tissue is called *cork*?
2. Define the nature of *tuber*, and give an example.

3. Explain the character of the *venation* of the leaves of monocotyledons and of dicotyledons.
4. Give the characters of the natural order of *Lobeliaceæ*.
5. Name the officinal drugs from the natural order of *Gentianaceæ*.

PHARMACY.

1. How many grams are there in an Avoirdupois Ounce, Kilogram, Troy Pound, Fluid Ounce of Water at 60°F, Cubic Centimeter of Water at 4°C.?
2. Explain the method of using the most accurate instrument for taking the specific gravity of liquids.
3. Define the following pharmaceutical terms: Extract; Suppository; Ointment; Precipitate; Saturated Solution.
4. Explain briefly the theory of percolation.
5. What is the Pharmaceutical meaning of the following terms: Filtrate; Dialysis; Menstruum; Desiccation; Water-bath.

CHEMISTRY.

1. Describe the barometer. How does it measure the pressure of the atmosphere?
2. Describe the Bunsen battery cell, and state which is the positive and which the negative pole.
3. Write the reaction for the production of Hydrochloric Acid.
4. Mention some of the methods by which Ammonia is produced.
5. Give the formulas and names of the several varieties of Phosphoric Acid.

COMMITTEE.

1. Describe, or illustrate by a diagram, any two of the following forms of leaves: Cordate; Lanceolate; Orbicular; Ovate; Obovate; Peltate.
2. Give the botanical name and natural order of three plants which yield officinal leaves.
3. What are the physical properties of Bromine? Write its symbol and give its specific gravity. What are its compounds with other elements called?
4. State the source of Sulphur and its symbol. What is a compound of Sulphur with another element called? What occurs when Sulphur is heated in contact with air?
5. State which is the heavier, an Avoirdupois or a Troy ounce, and how much? Also, state the difference, in grains, between an Avoirdupois and a Troy pound, and the number of ounces in each.

Specimens for Recognition.

<i>Mentha piperita</i> ,	<i>Vinum Ergotæ</i> ,	<i>Sulphur præcipitatum</i> ,
<i>Lavandula</i> ,	<i>Syr. Pruni Virgin.</i> ,	<i>Acidum Sulphurosum</i> ,
<i>Anthemis</i> ,	<i>Extract Buchu fluid</i> ,	<i>Acidum hydrochloricum</i> .
<i>Arnica</i> ,		

The examination resulted in the passing of the large majority of the students and their admission to the senior course. Those who failed in one or more branches will be granted another examination near the close of September next.

Later on the same evening the Junior Class had a farewell reception at W. H. Shuster's, on which occasion the members of the faculty were present by invitation.

The examination of the *senior students* commenced on Saturday, February 28, one series of questions being given on four consecutive days, and closed on March 4th with the practical exercises.

QUESTIONS IN MATERIA MEDICA AND BOTANY.

A. Give the source of *Rhubarb* as to the plant or plants, natural order and country producing it. Describe the physical and the structural characteristics of the drug. Name a crystallized Salt, and the important organic constituents of *Rhubarb*. What effect have the alkalies upon its liquid preparations? What other officinal root contains the same characteristic constituents as *Rhubarb*?

B. Give the botanical name, natural order and habitat of the plant yielding *Calamus*. What part is used? Describe its physical properties with the position and arrangement of the rootlets and its structural characteristics, naming the cause of the spongy appearance of fresh *Calamus*. Enumerate its medicinally important constituents, and give its medical properties.

C. What officinal *Rhizomes* are obtained from the order of *Ranunculaceæ*? Give the botanical names of the plants, with their habitat. Describe each drug briefly, and give their medical properties and doses.

D. Give the botanical name, natural order, habitat and part of the plant yielding *Quassia*. Describe the drug, and the behavior to simple solvents of its bitter principle. What is the botanical source of *Surinam Quassia*, and how does this differ from the officinal drug?

E. What is *Prickly Ash*? Give the names, natural order and habitat of the plants yielding the drug; also the commercial varieties, and describe the characteristics of each variety. What are its medical properties and dose?

F. Which officinal *leaves* are *lobed*? Give of each the name, natural order and habitat of the plant. Describe each drug briefly and name the important constituents, medical properties and dose of each.

G. Give the botanical characters of the natural order of *Umbelliferae*. Name the officinal fruits obtained from this order, and state to which sub-order each one belongs, and the number of oil tubes found in each fruit.

H. What is *Calabar Bean*? From which plant, natural order and country is it obtained? Describe the physical properties of the drug and its structure. Name the active constituents, and give the medical properties and the dose of the drug.

I. What is *Copaiba*? Name the plants yielding it, their natural order and native country. Describe briefly the drug and its proximate constituents. State in what respects the principal commercial varieties differ and how adulterations may be recognized.

K. Describe the officinal *Opium*, and give the average amount of moisture contained in, and the amount of aqueous extract yielded by it. How may adulterations with extracts, gums and starches be detected? How much Morphia should dry *Opium* contain? Name some of the other Alkaloids; also, the Acid found in *Opium*, and give a characteristic reaction of the last named principle.

QUESTIONS IN PHARMACY.

A. Write out the answers to the following, showing the method of obtaining the results: How many grams in a liter of Stronger Ether at 4°C.? in a centiliter of Monsel's Solution at 4°C.? in a hectoliter of Creasote at 4°C.? in a pint of Glycerin at 60°F.? in a cubic centimeter of Mercury at 4°C.?

B. Define the following terms used in Pharmacy: Stearopten; Gum Resin; Glucoside; Balsams; Alkaloid; and name one officinal stearopten, three officinal gum resins, two officinal glucosides and five officinal alkaloids.

C. Give the ingredients used in preparing and the officinal names of the following: Soap Cerate; Syrup of Almond; Tincture of American Hellebore (with proportions); Compound Iodine Ointment; Wine of Rhubarb; Fluid Extract of Conium Fruit; Iodide of Ammonium; Yellow Oxide of Mercury; Donovan's Solution; Plummer's Pills.

D. How are Sugars divided into classes, for convenience in studying their chemical properties? Give a prominent example of each class. Give a test to show the identity of each example which you have chosen. What variety of Sugar may be prepared from Starch? From what other sources can this variety be prepared?

E. Name the Acid present in officinal *Vinegar*. From what source is the Commercial Acid obtained? What impurities are usually present in the Acid? How may they be detected? What is the U. S. Pharmacopœia test for its strength? What is the chemical name for *Pyroxylon*? How is it prepared? What are its properties? State how two officinal preparations of it are made. Give the uses of these preparations.

F. Give the ingredients and English names for *Acidum Sulphuricum Aromaticum*,

Confectio Opii, Emplastrum Ammoniaci cum Hydrargyro, Infusum Rosæ Compositum, Liquor Iodini Compositus, Pilulæ Aloes et Myrrhæ, Spiritus Juniperi Compositus, Syrupus Rhei, Tinctura Cantharidis, Trochisci Sodii Bicarbonatis.

G. Name two official liquids obtained directly from the *Lemon*. What Acid is present in this fruit? How is it prepared? What are the usual impurities? How may they be detected? What other Acid does it closely resemble? What chemical tests serve to distinguish them? What is the quantivalence of each? Name four official preparations of the Acid from Lemons. Name four official preparations of the Acid which it most closely resembles.

H. How is diluted *Hydrocyanic Acid* prepared? What is the standard of strength adopted by the U. S. Pharmacopœia? How may it be preserved? In what official Syrup is it found? Why is it present in this Syrup? What active substance is produced when Ground *Black Mustard Seed* is treated with water? Is the same substance produced when *Yellow Mustard Seeds* are similarly treated? How are Prepared *Sinapisms* or Mustard Leaves usually prepared? What precautions are necessary to keep them? How are they used practically?

I. How is *Pyrophosphate of Iron* prepared? What takes place when its solution is mixed with Diluted Phosphoric Acid in excess? How is Diluted Phosphoric Acid prepared? What is its specific gravity? What are the official tests?

K. Name three official preparations containing *Metallic Mercury*. What is the percentage of Mercury in each? How may the quantities of Metallic Mercury in each be ascertained? Name two official combinations of Iodine with Mercury. State how each is prepared.

QUESTIONS IN CHEMISTRY.

A. What is the official process for preparing Potassium Iodide? Give the two reactions showing the two stages of the process. How may a trace of Iodate remaining be detected? Explain the reaction involved in this test.

B. What is the composition of *Ammonii Carbonas* in the dry state, and what does it become when in solution? Why is Ammonia Water to be added to this solution in preparing Neutral Ammonium Carbonate?

C. What is the difference between *Carbo Animalis* and *Carbo Animalis Purificatus*? Describe the mode of treatment by which the first is converted into the second. How does *Carbo Animalis* differ from *Bone-Ash*, and how is each produced?

D. What are the means of distinguishing between *Ferrous* and *Ferric* Salts? Give the chemical formulas of the several reagents used; also the formulas of the compounds they form with the Ferrous and Ferric Salts, respectively.

E. Describe *Marsh's test* as applied to Arsenic and to Antimony, respectively, and enumerate points of difference in the two cases, giving the tests by which we may decide certainly as to which element is present.

F. How would you test *Calomel* for a trace of *Corrosive Sublimate*, and how would you remove any such trace from the Calomel?

G. How is *Ether* made? What precautions are necessary to insure a good yield and a pure product? Give its chemical formula, and state its relationship to Alcohol.

H. Describe *Glycerin*. To what class of organic compounds does it belong? In what naturally occurring compounds is it found, and how are these compounds decomposed? What is formed at the same time that Glycerin is liberated?

I. What is the source of Tartaric Acid? Give its formula. Give the formula of *Potassii Tartras*, of *Potassii Bitartras*, of *Potassii et Sodii Tartras*, of *Antimonii et Potassii Tartras*.

K. To what class of organic compounds does *Acidum Tannicum* belong? Whence is it obtained? What are the characteristic reactions of it, as detailed in the Pharmacopœia?

QUESTIONS BY THE EXAMINING COMMITTEE.

A. Give the botanical name of the plant which yields *Seneka*. To what natural order does it belong? Describe briefly the physical and structural characteristics of the Root. What are the chief constituents of *Seneka Root*? State the various names which have been given to the supposed active principle. In which portion of

the Root does the activity reside? What other Roots have usually been found mixed with Seneka as impurities? What entire substitution for Seneka has occurred within a few years? What is the cause of the liquid preparations of Seneka becoming gelatinous? and what will prevent this, or remove it if it has already occurred? Write out in full three official names of preparations of Seneka.

B. Give the official name of *Gamboge*. The botanical name of the plant which yields it. Its natural order. Habitat. How is the drug obtained from the plant? To what principle is the activity due? What are its medical properties? What is the dose for an adult? Name an official preparation into which it enters. What effect has an alkaline solution upon it?

C. Give the official name and parts used medicinally of the following drugs; also the botanical name, natural order and habitat of the plants which furnish them: Camphor, Rhatany, Turpentine, Ipecacuanha, Squill, Galls, Arrow Root, Liquorice, Sago, Arnica.

D. What is *Bromine*? From what source is it obtained? State the mode of its preparation. Write its symbol. Give its specific gravity. What is its quantivalence? Describe its physical properties. Name two of its official compounds. What is its compound with Hydrogen called? Write the formula for this compound.

E. What is the official name of *Epsom Salts*? From what source is it obtained? How is it prepared? Give its general characteristics, and a test of its purity. What is the official name of *Glauber's Salts*? From what source is it obtained? How is it prepared? Give its general characteristics, and a test of its purity. How may these two Salts be distinguished from each other?

F. Give the official names and ingredients of the following preparations (omitting quantities), with the dose of those intended for internal administration: Fowler's Solution, Compound Spirit of Lavender, Antimonial Wine, Paregoric, Soap Liniment.

G. Give the formulas and describe the process of making the following preparations (omitting quantities): *Pilula Ferri Carbonatis*, *Pulvis Aromaticus*, *Liquor Sodæ Chlorinatæ*, *Syrupus Rhei Aromaticus*, *Emplastrum Plumbi*.

H. Give the official name of *Muriate of Ammonia*. Describe its appearance as found in commerce. What is the effect of heat upon it? What effect will be produced by triturating it with Hydrate of Calcium? What impurity is usually present in the commercial article? Name a test which will indicate this impurity in solution. What purified preparation is recognized by the United States Pharmacopœia? Give the mode of its purification (omitting quantities). State the reaction which takes place during the process. What is the appearance of the purified article.

I. Criticise the following prescriptions, in I and K, state how you would prepare them, and whether you would dispense them:

1.

R—Quiniæ Sulph., . . . gr. xx
 Acid Sulph. Dilut., . . . fʒii
 Ext. Glycyrrh. Fld., . . . fʒi
 Aquæ, q. s. ut. ft. . . fʒii

Sig:—A teaspoonful every two hours.

3.

R—Acid. Arsenios., . . . gr. iii
 Pulv. Opil., . . . gr iv
 Extract. Gentian., . . . ʒi

Misce, et fiat massa in pil. no. xx dividenda.

Sig:—One to be taken three times a day.

2.

R—Hydrarg. Chlorid. Mit., . . . gr. ii
 Antim. et Pot. Tart., . . . gr. ss
 Pulv. Ipecac. Comp., . . . ʒss
 Tinct. Aconiti Rad., . . . gtt. xxiv
 Tinct. Verat. Virid., . . . gtt. xxiv
 Sacch. Alb., . . . ʒi

Fiat pulvis, in chart. xii dividend.

Sig:—One to be taken every three hours.

4.

R—Potass. Chlorat., . . . ʒiii
 Acid. Nitromuriatic., . . . fʒi
 Syrup., . . . fʒii
 Aquæ, . . . fʒiii

Misce.

Sig:—A dessertspoonful to be taken in water every four hours.

K.

5.

R—Tinct. Cannabis. Ind., . . . f3v
Aquæ Menth. Pip., . . . f3ii
Ft. mist.

Sig:—A teaspoonful to be given three times a day.

7. OLEAGINOUS MIXTURE.

R—Olei Tiglii, f3ii
Tinct. Opii, ℥ xv
Pulv. Acaciæ, aa 3ii
Sacchari, aa 3ii
Aq Menth. Virid., f3ii

Ft. mist. sec. art.

Sig:—Shake the mixture, and take a tablespoonful every two hours till it operates.

6.

Write out a prescription containing at least three ingredients, using their official titles in full.

8.

Write out a direction for preparing this Prescription. When prepared, would you dispense it?

R—Acid. Arsenios., gr. xvi
Potassii Bicarb., gr. xvi
Spir. Lavand. Comp., f3i
Aquæ Destillatæ, f3iv

Liqua sec. art.

Sig:—A teaspoonful to be taken three times a day.

The following is the list of specimens selected for recognition :

MATERIA MEDICA.	PHARMACY.	CHEMISTRY.	EXAMINING COMMITTEE.
Taraxacum,	Aqua creasoti,	Ammonii chloridum purif.,	Cetraria,
Filix mas,	Infusum Pruni Virginianæ,	Potassii bichromas,	Canella,
Podophyllum,	Tinctura Myrrhæ,	Magnesii sulphas,	Arnica,
Serpentaria,	Syrupus sarsaparillæ compos.,	Zinci sulphas,	Anisum,
Uva ursi,	Extractum Taraxaci fluidum,	Ferri phosphas,	Cubeba,
Carum,	Linimentum saponis,	Plumbi acetas,	Resina,
Juniperus,	Spiritus ætheris compositus,	Atimonii sulphuretum,	Aqua Camphoræ,
Nux vomica,	Glycerina,	Alcohol amylicum,	Spir. Lavandulæ comp.
Lycopodium,	Pulvis Rhei compositus,	Acidum aceticum,	Ext. glycyrrhizæ fluid.
Mastiche,	Acidum benzoicum,	Acidum gallicum,	Cupri sulphas.

The practical examination consisted in the spreading of a blistering plaster, and in the preparation of a copaiba emulsion, of powders composed of zinc sulphate and lead acetate, and of suppositories containing extract of opium and of belladonna.

The following candidates passed the examination and were recommended for the degree of Graduate in Pharmacy :

JOHN FREDERICK OSCAR AGTHE, North Carolina, *Preparation of Phosphorus Pills*.
CHARLES HAMILTON BALLANTINE, Pennsylvania, *Unguentum Hydrargyri Nitratis*.
RICHARD CALCOTT BARRINGTON, New Jersey, *Phosphorus*.
FENWICK HAZLETON BASSETT, New Jersey, *Lactic Acid and its Compounds*.
CHARLES BEALE, Pennsylvania, *Chloroform*.
ALLEN LESLIE BELLEVILLE, Delaware, *Salicylic Acid*.
ALEXANDER ELWELL BENNETT, New Jersey, *Glycerin*.
GEORGE MAHLON BERINGER, Pennsylvania, *Caffeina*.
EDWIN HUGH BIDWELL, New Jersey, *The Halogens*.
EDWARD GEORGE BOYSEN, New York, *Emulsions*.
LEWIS COLLOREDO BOYSEN, New York, *The Miseries in Pharmacy*.
MITCHELL BAXTER BROOKS, Pennsylvania, *Plasma, its Pharmaceutic Value*.
EDWIN RAUGHLEY BURDICK, Delaware, *Absence of Tannic Acid in Living Plants*.
CHARLES BLAIR CARL, Pennsylvania, *Tincture of Kino*.
WILLIAM HENRY CARSLAKE, New Jersey, *Cerasus Serotina*.
HARRY SCOTT CLARK, Pennsylvania, *Pharmacist's Study of Vegetation*.
LEWIS CLAY COLLIER, Ohio, *Prinos Verticillatus*.
THOMAS S. COLLINS, New Jersey, *Chenopodium Anthelminticum*.
GEORGE HAVENS COLTON, Massachusetts, *Xanthoxylum Carolinianum*.
GEORGE EMIL DAHIS, Pennsylvania, *Pills and Pill Coatings*.
ADAM CLARION DANIELS, Pennsylvania, *Glycerin*.
AUGUST JACOB DETZER, Indiana, *Chemical Affinity in Compounding Medicine*.
WILLIAM CROSSETT DOCKSTADER, Delaware, *Anamirta Cocculus*.

- FRANK FREDERICK DRUEDING, Germany, *Syrupus Ferri Iodidi*.
 CHARLES WILLIAM ELKINS, Pennsylvania, *Aralia Spinosa*.
 GEORGE BRYAN EVANS, Pennsylvania, *Physostigma*.
 PARKER HOOVEN FAMOUS, Pennsylvania, *Euonymus Atropurpureus*.
 GEORGE ADAM FERDINAND, Iowa, *Citric Acid in Cranberry*.
 GEORGE WASHINGTON FISHER, Pennsylvania, *Syrupus Ferri Iodidi*.
 OLIVER JOHN FREEMAN, Pennsylvania, *Zinc*.
 FRANK FRISBY, Kansas, *Fucus Vesiculosus*.
 GUSTAV ADOLPH FRUH, Pennsylvania, *Oil of Wintergreen*.
 DANIEL JOSHUA FRY, New Jersey, *Olibanum*.
 SAMUEL WESLEY GADD, England, *Syrups and their Preparation*.
 THOMAS MULLIN GALBREATH, Maryland, *Emulsions*.
 SAMUEL FRANKLIN GARMAN, Pennsylvania, *Powdered Chinoidin*.
 ROBERT GIBSON, JR., W. Virginia, *Cornus Circinata*.
 JAMES ALEXANDER DAVIS HALLOWELL, California, *Fermentation*.
 FRANK SCOTT HARKER, Pennsylvania, *Aqua Purificatio*.
 FRANCIS E. HARRISON, Pennsylvania, *Improved Lozenge Apparatus*.
 ALFRED KERR HARTZELL, Pennsylvania, *Helianthemum Canadense*.
 CONRAD GABRIEL HOELL, New Jersey, *Cerates and Ointments*.
 JOHN WILSON HOFFA, Pennsylvania, *Commercial Extract Krameria*.
 LOUIS HENRY HOLDEN, Pennsylvania, *Aralia Spinosa*.
 WILLIAM C. HOLZHAUER, Wisconsin, *Eriodictyon Californicum*.
 GEORGE HENRY JACKSON, Pennsylvania, *Fermentation*.
 WILLIAM OSCAR JACOBY, Pennsylvania, *Eupatorin*.
 WASHINGTON WILLIAM JOST, Pennsylvania, *Polygala Senega*.
 JAMES PECOR KERN, Pennsylvania, *Eupatorium Perfoliatum*.
 STIRLING KERR, JR., Pennsylvania, *Pharmaceutical Manipulation*.
 THOMAS FRANKLIN KEYS, Pennsylvania, *Failure of Medicinal Substances*.
 WILLIAM JOHN KILLINGBECK, New Jersey, *Gum Arabic*.
 JOHN KLEMET, Pennsylvania, *Preservation of Drugs*.
 JOHN WILLIAM KOHLERMAN, Delaware, *Fluid Extracts*.
 WILLIAM HENRY LANTZ, Pennsylvania, *Aralia nudicaulis*.
 GEORGE LATIN, Ohio, *Eupatorium Perfoliatum*.
 ISAAC LAVENSON, Pennsylvania, *Roots and Rhizomes*.
 ARTHUR EVERETT LEWIS, Pennsylvania, *Meconic Acid*.
 FREDERICK LOOS, JR., Pennsylvania, *Glycerole of Cinchona*.
 AMANDUS JULIUS LUETHE, Wisconsin, *Empiricism*.
 JOHN EDWARD MCCAMBRIDGE, Pennsylvania, *Hydrargyri Iodidum Viride*.
 ANDREW JAMES McFEETERS, Pennsylvania, *Resina Podophylli*.
 JOSEPH SUMMERFIELD MADISON, Pennsylvania, *Aristolochia Serpentina*.
 JOHN MAIER, Pennsylvania, *Eupatorium Perfoliatum*.
 ALFRED STANGER MARSHALL, New Jersey, *American Druggists*.
 ARTHUR ROBINSON MILBY, Delaware, *Glass*.
 WILLIAM LELAND MILLER, Mississippi, *Value of the Laboratory*.
 WILLIAM MOSES MILLER, New Jersey, *Eriodictyon Glutinosum*.
 BERNARD JAMES MURRAY, Pennsylvania, *Rubus*.
 GEORGE HENRY OCHSE, Pennsylvania, *Liquor Ferri Acetici Ph. Ger.*
 ANDREW ALLISON O'DANIEL, Pennsylvania, *Elegant Pharmacy*.
 THOMAS EDWIN OGRAM, Pennsylvania, *Chrysophanic Acid*.
 WILLIAM MAXWELL OPDYCKE, Pennsylvania, *The Apothecary*.
 HORACE HILDEBRAND OWEN, Pennsylvania, *Terebinthina*.
 ORIC HENRY PAXSON, JR., Pennsylvania, *Aralia spinosa*.
 WILLIAM JOSEPH PECHIN, Pennsylvania, *Pinus Palustris*.
 NATHAN PENNYPACKER, Pennsylvania, *Salix Alba*.
 HENRY EUGENE PETERS, Pennsylvania, *Eriodictyon Californicum*.
 LOUIS CLARK PETTIT, Ohio, *Eugenic Acid*.
 LINNÆUS S. POLEY, Pennsylvania, *Xanthoxylum Fraxineum*.
 JOHN BREWSTER REYNOLDS, Pennsylvania, *Tinctura Opii Deodorata*.

CHARLES HAINES ROBERTS, New Jersey, *Botany*.
 EDWARD MANNING ROCHE, JR., Pennsylvania, *Jaborandi*.
 GEORGE REDSECKER ROSS, Pennsylvania, *Sanguinaria Canadensis*.
 CHARLES WILLIAM SAALFRANK, Pennsylvania, *Syrupus Rad. Glycyrrhizæ*.
 HARRY SCHANDEIN, Pennsylvania, *Unguentum Benzoini*.
 GEORGE WILLIAM SCHIMMINGER, Pennsylvania, *Comptonia Asplenifolia*.
 JACOB SHELLY, Pennsylvania, *Fluid Extracts*.
 HARRY HUBER SHERK, Pennsylvania, *Polygonum Hydropiper*.
 WILLIAM HUNTLEY SHORT, Pennsylvania, *Liquor Magnesii Citratis*.
 SILAS HENRY SHULL, Ohio, *Pharmacists and Physicians*.
 CHARLES EDWARD SLOUGH, Pennsylvania, *Pharmaceutical Botany*.
 HARRY LEEDOM SMEDLEY, Pennsylvania, *Asclepias Syriaca*.
 GEORGE FARRAR SMITH, JR., Tennessee, *Ointments*.
 WILLIAM HARROLD SMITH, JR., Pennsylvania, *Glycerin*.
 JOHN EDWARD SOMBART, Missouri, *Suppositories*.
 LOUIS JOSEPH STELTZER, Pennsylvania, *Castanea*.
 CHARLES PETTIT STOUT, New Jersey, *Spigelia Marilandica*.
 SAMUEL WILLIAM STRUNK, Pennsylvania, *The Metric System*.
 STEPHEN LIVERSIDGE TALBOT, Massachusetts, *Equivalence of Drops*.
 WILLIAM JAMES THORNLEY, Pennsylvania, *Oenothera Biennis*.
 JOSEPH ALEXANDER TITCOMB, Tennessee, *Pills*.
 WILLIAM GEORGE TOPLIS, Pennsylvania, *Gelatin Lozenges*.
 HERMAN VAN ALLEN, Wisconsin, *Viburnum Prunifolium*.
 WILLIAM SAMPSON WALLACE, Ohio, *Falsifications*.
 FRANK STEPHEN WARNER, Ohio, *Digitalis*.
 EDWARD WARRINGTON, New Jersey, *Cosmolin and Vaseline*.
 GEORGE C. WEBSTER, Pennsylvania, *Aristolochia Serpentina*.
 JAMES ADDISON WHITE, Ohio, *Hydrastis*.
 GEORGE ELI WILLIAMS, New York, *Absorption of Moisture*.
 GEORGE BYRON WINEBRENNER, Maryland, *Coccus Cacti*.
 PRESTON REUBEN YOUNG, Pennsylvania, *Adulteration of Beer*.
 CHARLES FREDERICK ZELLER, Pennsylvania, *Thalleioquin Test*.
 MASON WOOWARD ZIMMERMAN, Pennsylvania, *Glycyrrhiza Glabra*.

The graduating class and the members of the Board of Trustees accepted an invitation tendered by the faculty for a reception at the College hall, on the evening of March 15th. A pleasant evening was spent, enlivened after supper by toasts, speeches and songs.

The commencement was held at the Academy of Music on the evening of March 16. The degree of Ph.G. was conferred by the President of the College, Dillwyn Parrish. The Procter medal, which is awarded to the student presenting a meritorious thesis, attaining the highest general average at the examination, and receiving the mark *very satisfactory* in each branch, was presented by Prof. Remington to Geo. H. Colton, of Springfield, Mass. Honorable mention was made of the following graduates whose general average at the examination was *very satisfactory*: G. M. Beringer, L. C. Collier, D. Fry, Jr., T. M. Galbreath, R. Gibson, Jr., F. S. Har-ker, C. G. Hoell, J. W. Hoffa, G. H. Ochse, H. C. Peters, J. E. Sombart, C. P. Stout, S. W. Strunk, S. L. Talbot, C. F. Zeller and M. W. Zimmerman.

Prof. Sadtler presented the prize of \$100 offered by Henry C. Lea, Esq., for the best thesis, to Stephen L. Talbot, of Boston, Mass. The thesis of the following gentlemen were deemed worthy of honorable mention: G. H. Colton, L. C. Col-lier, G. A. Ferdinand, F. Frisby, R. Gibson, Jr., F. E. Harrison, J. W. Hoffa, L. H. Holden, W. C. Holzhauer, G. Latir, J. E. McCambridge, L. C. Pettit, L. J. Steltzer, H. Van Allen and C. F. Zeller.

The valedictory address was delivered by Prof. Maisch. At the close of the address Prof. Sadtler was surprised with a handsome silver tea set, presented to him by Thos. L. Collins on behalf of the class. As usual the exercises, which had attracted an unusually large audience, were interspersed with music and closed with the distribution of bouquets, books and other presents sent upon the stage by the friends of the graduates.

The Alumni Association of the Philadelphia College of Pharmacy gave its annual reception to the graduating class on the afternoon of March 15. After some introductory remarks by the President, W. E. Krewson, the recent graduates were admitted to membership, and the alumni gold medal was presented to G. H. Colton. The annual address was delivered by Jos. L. Lemberger, of Lebanon, Pa., of the class 1854, and was well received. The graduates having passed the best examination in the different branches were presented with alumni certificates, namely: R. Gibson, Jr., *Materia Medica*; S. W. Gadd, *Pharmacy*; C. G. Hoell, *Chemistry*; J. E. Sombart, *General pharmacy*, and Geo. Latin, *Pharmaceutical manipulation*. The spokesman of the graduating class was G. A. Ferdinand, whose valedictory address was very creditably delivered. The certificate for having attained the highest mark in the junior examination was awarded to Geo. Goebel, and after announcing the names of both the senior and junior students, who, in the recent examinations, received the general average *very satisfactory*, the audience dispersed.

[The Essex County, Mass., Pharmaceutical Association met in Plummer hall, Salem, Wednesday forenoon, February 18, at 10 o'clock. About 30 members were present when President Frothingham, of Haverhill, called the meeting to order. He spoke briefly, urging an increased effort to bring into the organization all the druggists of the county. He also urged that some action be taken to secure the repeal of the stamp-tax on many articles sold by the pharmacists. The president and secretary were constituted a committee to prepare a memorial to Congress, urging the repeal of this tax. Mr. Whitney, of Lawrence, read a valuable paper on ointments. Mr. S. A. D. Sheppard, of Boston, delivered an address on the history and objects of pharmaceutical associations. He thought that the pharmacists should give up the traffic in cigars, soaps and the like, cease to be merchants and become what they were by right, members of a profession. A discussion followed on the metric system, after which the members adjourned to the Essex House to dinner.

The entire company, after dinner, paid a visit to the "Marine Museum," and investigated all the attractions which their limited time allowed. The "first church," which was built in 1627, was among the objects of interest visited.

New York College of Pharmacy.—At the Commencement held at Chickering Hall, on the evening of March 16th, the following gentlemen received the degree of Graduate in Pharmacy:

John Albert, Jr., New York, *Percolation*.
 Emilio Bergara, Trinidad, Cuba, *Salicylic Acid*.
 J. A. Biskey, New York, *Water*.
 W. P. Blair, Columbus, Miss., *Fermentation*.
 Herman Breiting, Germany, *Phosphorus and Acid*.

J. C. Comstock, Windsor, N. Y., *From Seed to Seed*.
 J. Dahlbender, Mainz, Germany, *Mercury*.
 Eugene W. Denton, New York, *Osmose*.
 W. S. Disbrow, Newark, N. J., *Copper*.
 Ch. H. Duffy, England, *Antimony*.
 Joseph Feil, Cleveland, O., *Podophyllin*.
 W. Frank Fiero, New York, *Glycerin*.
 H. F. Frank, Rahway, N. J., *Digitalis*.
 Fr Aug. Grenzebach, Peekskill, N. Y., *Glycerin*.
 Joseph A. Herb, New York, *Cathartics*.
 Ferd. Julius, New York, *Campbor and Preparations*.
 A. A. Kirschner, New York, *Chloride of Sodium*.
 Otto Klinkenberg, Jonesville, Ind., *Volatile Oils*.
 Alvin Geo. Koehler, Brooklyn, N. Y., *Iodine*.
 A. Th. Koertge, New York, *Opium*.
 Hy. M. Kolasky, Augusta, Ga., *Lead Plaster and Compounds*.
 George Kraft, Jr., Newburgh, N. Y., *Essential Oils*.
 Salvador J. Lahey, Ireland, *Belladonna*.
 Albert H. Lins, Mount Vernon, N. Y., *Acetic Acid*.
 B. H. Livingston, Brooklyn, N. Y., *Benzoin*.
 Albert A. Merritt, Pawling, N. J., *Xanthoxylum*.
 Charles Meyer, New York, *Opium*.
 Frank L. Morris, Newark, N. J., *Iron*.
 Frank Nadler, Peru, Ills., *Valerianic Acid*.
 Samuel Nauheim, London, Eng., *Zinc*.
 J. J. R. Paulsen, Yew York, *Digitalis*.
 J. A. Proben, Hessen, Germany, *Copper*.
 Ph. Scheu, New York, *Paraffin*.
 H. C. Schmidt, Hoboken, N. J., *Digitalis*.
 Ch. J. Schneider, Germany, *Vaporization and Condensation*.
 F. T. Schultze, New York, *Pepsin*.
 Oscar W. Stiebeling, New York, *Arsenic*.
 F. G. E., Strahlemann, Oldenburg, Germany, *Volatile Oils*.
 W., Tack, New York, *Seidlitz Powder*.
 Hy. C. Thomm, Oswego, N. Y., *Cork*.
 G. A. Van Deinse, Holland, *Hydrargyrum*.
 John A. Whittet, New York, *Jaborandi*.
 Max Wustrow, New York, *Stramonium*.
 H. S. Zeuschner, New York, *Belladonna*.

Of this class, we have been informed, the highest average was obtained by Joseph Feil. At the junior examination, which was held this year for the first time, ninety-one students were successful, the class being headed by René Ravenel Snowden.

Maryland College of Pharmacy.—The 28th Annual Commencement exercises took place at the Academy of Music on the evening of March 22, when the degree of Ph.G. was conferred by the President, Joseph Roberts, upon the following gentlemen:

Joseph Ayd, Maryland, *Distillation*.
 Royal H. Bussler, Pennsylvania, *Pharmacy*.
 Ernest F. Hein, Germany, *Sulphur*.
 John Herr, Maryland, *Physostigma*.
 John H. Frames, Maryland, *Antimony*.
 Chas. H. Lee, Louisiana, *Syrup of Iodide of Iron*.
 Zebulon Lowe, Maryland, *Petroleum*.
 A. B. Reese, Virginia, *Emulsions*.

Chas. Schmidt, Maryland, *Carbon*.
 Frank E. Stough, Ohio, *Podophyllin*.
 Wm. F. Thiede, Jr., Maryland, *Iodine*.
 M. J. Wolf, Maryland, *Belladonna*.
 Gustav Woltereck, Germany, *Bromine*.

The following prizes from the College to the Graduating Class were presented by Dr. Roberts: The gold medal to Charles Schmidt, the second prize, consisting of copies of "Fresenius' Chemistry," "Wöhler's Organic Chemistry" and "Armstrong's Organic Chemistry," to Chas. Hill Lee, and the third prize, consisting of copies of the "National Dispensatory" and the "German Pharmacopœia," to Ernest F. Hein.

The recipient of the College prize to the Junior Class, consisting of "Shakespeare's Complete Works," was William Caspari, Jr. The gold medal from the Alumni Society was presented by Prof. Simon to Charles Hill Lee.

The following Junior Class students are entitled to honorable mention: Wm. Caspari, Jr. (Prize), R. P. C. Scheidt, E. H. Kabernagle, A. H. Shultze, Cameron Piggot, Hammond Mason, Clarence F. Moore and R. S. McKinney.

The valedictory address was delivered by Rev. Julius E. Grammer, D.D. The exercises were enlivened by choice music and a number of floral and other gifts were presented by the friends of the graduates.

Pittsburgh College of Pharmacy.—The first graduating class of this institution received their diplomas on the evening of March 11, the commencement exercises being held at Lafayette Hall. The degree of Graduate in Pharmacy was conferred by the President, Geo. A. Kelly, upon the following gentlemen:

George Fry (*Syr. Glycyrrhizæ*), Charles L. Kuhn (*Evaporation*), Adolph Henry Kraeling (*Pill Excipients*), James Macbeth Little (*Syr. Phosphates Comp.*), Samuel McElroy, Jr. (*Pharmacy Laws*), James Clancy McElroy (*Calisaya Bark*), James Sansom McBride (*Eucalyptus Globulus*), A. C. Robertson (*Berberis Aquifolium*), Oliver C. Sarver (*Pharmaceutical Cleanliness*), David Franklin Sawhill (*Emulsions*), John Wurzell (*Pure Sulphate of Copper*).

Mr. W. D. Moore addressed the audience, dwelling mainly on some abuses which are sometimes practised under the cover of pharmacy. The valedictory address on behalf of the class was delivered by J. C. McElroy, and on behalf of the Faculty by Prof. W. G. Reiter, M.D.

Louisville College of Pharmacy.—The commencement exercises were held at the Hall of the College, on Green street near First, Monday, March 15. The valedictory address, delivered by Prof. C. L. Diehl, was full of sound advice. The degree of Graduate in Pharmacy was then conferred upon two gentlemen, Messrs. Wagner and Mehringer, and the following gentlemen, Messrs. Stahl, Shelly, Buschemeier, Seiler, Johanboecke, Struby, having successfully passed the junior examination, were granted certificates to that effect.

Mr. Jacob Flexner, on behalf of the Alumni of the College, then presented the prizes offered by that association, consisting of a gold medal to the graduate having the highest average (Mr. Wagner), and of a copy of "Pharmacographia" to the senior student (Mr. Stahl) passing the best examination, and delivered an address appropriate to the occasion.

Cincinnati College of Pharmacy.—The Commencement exercises closing the ninth session of this college were held March 16th, at Melodeon Hall, when the degree of Graduate in Pharmacy was conferred by the President of the college upon the following gentlemen:

Julius Eichberg, Petersburg, Va., *Hard and Soft Water*.
 John Fabing, Cincinnati, *Analysis of Conchelaqua, or Quinine Plant*.
 Francis Grieme, Cincinnati, *Alstonia Constricta*.
 Rob. Groenland, Cincinnati, *Commercial Carbonate of Soda*.
 G. A. Hans, Cincinnati, *Hydrastis Canadensis*.
 Arthur Heinemann, Cincinnati, *The Mexican Vine*.
 E. F. Hallenbeck, Cincinnati, *Collinsonia Canad.*
 John W. Honaker, Owinsville, Ky., *An Examination of the Root of Helleborus*.
 Jacob W. Jones, Cincinnati, O., *Emulsions*.
 Chas. R. Judge, Cincinnati, O., *Dialyzed Iron*.
 F. E. Kline, Cincinnati, O., *Ailanthus Glandulosa*.
 J. M. Long, Cincinnati, O., *Soaps of Pharmacy*.
 Chas. C. Reakirt, Jr., Cincinnati, O., *Suppositories of the U. S. P.*
 Henry I. Schulte, Cincinnati, O., *Cascara Sagrada*.
 Edward Speidel, Cincinnati, O., *Ferro-phosphated Elixir Calisaya Bark*.
 H. G. Westphal, Germany, *Benzoate Sodium*.
 Otto S. Weusthoff, Dayton, O., *Robinia Pseudacacia (common Locust)*.

The exercises were enlivened by music, and addresses were delivered on behalf of the faculty by Prof. E. S. Wayne, and on behalf of the Board of Trustees by Thad. Reamy, M.D.

The professors' prizes, consisting of gold medals, were awarded to Jul. Eichberg (Chemistry), Otto S. Weusthoff (Materia Medica and Botany), Charles R. Judge (Pharmacy), and the Alumni gold medal, for the best general examination, to Julius Eichberg.

St. Louis College of Pharmacy.—The Fourteenth Annual Commencement exercises were celebrated Tuesday evening, March 16th, 1880, at Germania Hall. The President, Mr. George Ude, addressed the select and numerous audience in a few well-chosen remarks, and handed to each graduate the diploma of the college conferring the degree of "Ph.G." Their names are: Messrs. E. G. Bauer, V. E. Eilbracht, Zeno Felder, Julius Feickert, S. F. Flint, F. A. Graichen, E. T. Green, Erwin Grimm, A. Hamel, H. Hoyer, John P. Huhn, L. Kempf, Theo. Klipstein, Thomas Knoebel, A. A. Krusskopf, F. T. McAuliffe, A. Pohrer, A. Rohlfing, Benjamin Saenger, Emil A. Sennwald, H. Stubbemann, A. Temm, A. Troxell, Chr. Van Zandt, F. Vedda and A. Wellmeyer. The silver medal of the Alumni Association, to be awarded to the graduate who attained the highest average in all the branches taught, was presented by Prof. J. M. Good to Mr. Emil A. Sennwald. The following received honorable mention: Messrs. A. A. Krusskopf, Theo. Klipstein and Thomas Knoebel. The valedictory address, delivered by Prof. Chas. O. Curtman, was a masterly effort. The valedictory address in behalf of the class was delivered by Mr. S. F. Flint.

The addresses were interspersed with choice pieces of music. After the numerous bouquets and other floral offerings had been distributed, the balance of the evening was spent in a social reunion, the devotees of Terpsichore enjoying themselves until the wee small hours.

EDITORIAL DEPARTMENT.

The Diploma Swindle.—It was recently reported to a committee of the Massachusetts Legislature, that the Massachusetts Medical Society had proof positive of the following so-called colleges and universities, selling their diplomas without any evidence of study or fitness: American University of Medicine and Surgery, of Philadelphia; Philadelphia University of Medicine and Surgery; Physio-Eclectic Medical College, of Cincinnati, O.; Physio-Medical College (new issue), of Cincinnati; American Eclectic Medical College, of Cincinnati; St. Louis Homœopathic Medical College; St. Louis Eclectic Medical College; New England University of Medicine and Surgery, of Manchester, N. H.; University of Medicine and Surgery, of Haddonfield, N. J.; and American Vitopathic College, of Cincinnati, O.

Whether the list is complete, we do not know; but we remember that the names of the notorious Dr. John Buchanan and Wm. Paine were connected also with other concerns besides the first two mentioned above. Although the charters of these Philadelphia institutions (?) were repealed by the legislature for gross fraud, the business of diploma selling continued to flourish, until on February 28th last two reporters of the Philadelphia "Record" exposed the traffic, having obtained for the sum of \$25 from the dean of the so-called Philadelphia University, Rev. T. B. Miller, a certificate that they were entitled to practice medicine, and the promise of a diploma for an additional consideration. Two other ministers, Revs. Ingraham and W. Major, figured, the former as president, the latter as secretary of the institution. On March 18th Miller was expelled from the membership and ministry of the church to which he belonged, and Major was suspended from the ministry for one year.

It seems almost as if the law was powerless to reach such offenders. Years ago the attorney-general was officially requested to proceed against the fraudulent concerns. Notwithstanding this, they have not been molested, and it may be assumed that, although the shop has been closed for the present, the same institutions (?), perhaps under different officers, will again take up the old business as long as there is any money in it.

The Percentage Business and Cipher Prescriptions in California.—A bill has been introduced by Mr. Brauhart into the legislature of California making it a misdemeanor, punishable by a fine of from \$50 to \$500, for any apothecary and physician to pay or receive any money or property as a commission or reward for prescriptions. At a meeting of the California Pharmaceutical Society this bill was endorsed, and amendments were proposed making it a misdemeanor, punishable by a fine of \$50, for a physician refusing, upon the application of a competent pharmacist, to give the proper name or formula for any article or preparation of medicine which he may have prescribed by arbitrary signs, names or numbers, and for a pharmacist refusing in like manner, if he has knowledge of the proper name or formula.

Every reputable physician and pharmacist will acknowledge that there is nothing in this law but what is required by the codes of ethics of the medical and pharmaceutical societies; yet the "Western Lancet" opposes the measure, as we learn from a pamphlet by Prof. Emlen Painter, of the California College of Pharmacy. To what extent the discreditable practise is carried on will be seen from the following extracts from Prof. Painter's reply:

"At this very moment, in summing up, and without any references, I can call to mind as many as twenty physicians who are in the habit of writing cipher prescriptions, several of whom are classed among the leading physicians of the city, and who write by far the largest number of prescriptions of any practising here. If we may judge from such prescriptions as fall into the hands of druggists who are not in collusion with such physicians, at least 90 per cent. of them are written in that unprofessional manner. Some of these doctors, occupying public positions of honor and trust, some occupying professorships in our medical schools—especially in the medical department of the University of California—are, I am grieved to say, included in that category, and their influence is felt to such an extent that not a few of the young graduates seem to think that being paid a percentage on their prescriptions is a legitimate business transaction.

"And some professors, too, are in the habit of not only writing in cipher, but also of giving the prescription to the patient in a sealed envelope, with the printed address of a certain druggist upon it. It would appear that moral suasion is not sufficient in the other five cases out of the ten. Perhaps the fears that the patient might discover the important fact that he could get the same medicine at any other store for one-third of the price, impels these vampires to adopt this sealed envelope and the secret cipher plan."

The resolutions approving of the bill have been signed by 94 out of the 98 apothecaries of San Francisco, and it is to be hoped that a large proportion of the medical profession will likewise favor a measure for the suppression of the dishonorable collusion, having for its purpose the fleecing of the sick.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Lehrbuch der Pharmaceutischen Chemie. Von Dr. Hugo Schwanert, ordentl. Professor der Chemie an der Universität zu Greifswald. In drei Bänden. Erster Band. Mit 146 Holzschnitt-Illustrationen und einer Spectraltafel. Braunschweig: C. A. Schwetschke und Sohn. 1880. 8vo, pp. 756.

Pharmaceutical Chemistry, in three volumes. Vol. I, with 146 wood-cuts and a spectral chart.

A work on chemistry, intended for the special use of pharmacists, may be written from different stand-points and with different objects in view. Aside from such, which merely aim at teaching the most approved methods of manufacturing the various definite compounds employed in medicine, it may assume a certain knowledge of physical and chemical laws, and thus adapt itself to the wants of the more advanced student; or, it may endeavor at teaching chemistry to the novice who has yet to master those laws upon a knowledge of which the correct understanding of processes and reactions depends. A full and accurate knowledge of the pharmaceutical chemicals can doubtless be obtained only through an insight into the more important physical laws and into the importance of physical and chemical properties, and through a familiarity with the fundamental chemical laws, and with the production, constitution and behavior of elements and compounds, including such, which though not medicinally employed, are of importance on account of analogy, or because of being utilized in the preparation of medicinal chemicals. It is obvious, therefore, that among the material of a work on pharmaceutical chemistry many bodies may be omitted which for the theoretical chemist are of importance,

while, on the other hand, compounds possessing little theoretical interest, but interesting and important on account of their practical application in medicine, should be treated more in detail than is usually done in works on theoretical chemistry.

The work, the first volume of which is now before us, aims to develop the recognized theories and the accumulated facts of chemistry in its special application to pharmacy and medicinal compounds; and this object is continually kept in view by the author, who was formerly a practical pharmacist, and occupies a prominent position as teacher of chemistry.

The introductory chapter of the work defines the domain of pharmaceutical chemistry and the fundamental theories of natural philosophy, which are further developed in the chapter on the physical properties of bodies, embracing crystallography, alteration by temperature, latent and specific heat, absolute and specific gravity, influence of light, electricity and galvanism. The next chapter treats of the chemical properties of bodies, explaining the nature of elements, chemical compounds, equivalents, atoms, molecules, symbols, chemical equations and stoichiometric calculations, quantivalence, formulas, isomerism, metamerism, polymerism, chemical constitution, nomenclature and electrolysis.

After these general considerations, which occupy one-fourth of the present volume, the author proceeds to the description of the various elements and their compounds, reserving what is known as organic chemistry for a separate volume. The arrangement of the elements by the author is based in the first place upon the electrochemical affinities of hydrogen and oxygen, with which two all other elements may be arranged in two series; considering, at the same time, the quantivalence of the elements, they are placed into well-known natural and simple groups. But while these are generally recognized, the majority of chemical text-books depart in their arrangement from these groups, to which the author adheres, securing thereby the consecutive consideration of those elements most nearly related. While pointing out the fact that the definition of *metal* is based upon purely physical properties, the division into non-metallic and metallic elements is adhered to because convenient, and the members of the former division are treated of in this volume in the following order: Hydrogen, chlorine, iodine, bromine, fluorine, oxygen, sulphur, selenium, tellurium, nitrogen, phosphorus, arsenic, antimony, boron, silicon and carbon.

Throughout the book the familiarity of the author with the wants of the pharmacist is evident, the definitions and descriptions are clear and to the point, and there is a detail of matter which renders the book a most acceptable one as a text-book for the pharmaceutical student and as a work of reference for the practical pharmacist. Although there is no lack in the English language of good works on systematic chemistry, we are not acquainted with one of similar scope and usefulness in the special branch to which it is devoted. It is to be hoped that the remaining two volumes are sufficiently far advanced to secure their early publication.

Report on the Revision of the U. S. Pharmacopœia Preliminary to the Convention of 1880; being a rough draft of the general principles, titles and working formulæ proposed for the next pharmacopœia. Prepared and compiled by Charles Rice, chairman of the committee. New York: 1880. pp. 202.

This is the committee report which the American Pharmaceutical Association

ordered to be printed after receiving the necessary funds by subscriptions. Our readers are aware that we highly appreciate the invaluable services of the chairman, and the efficient labors of the various contributors. Notwithstanding this, we have been opposed to the publication of the report; but, although we see no reason to change our views, we sincerely trust that our misgivings may ultimately prove to have been unfounded.

Sore Throat, its Nature, Varieties and Treatment; including the connection between affections of the throat and other diseases. By Prosser James, M.D., Lecturer on Materia Medica and Therapeutics at the London Hospital, etc. Fourth edition. Philadelphia: Lindsay & Blakiston, 1880. 12mo, pp. 318. Price, \$2.

The intrinsic value of this work, and the researches of its author in the class of diseases of which the book treats are well known to our medical readers, and need no further comment. The typography is unexceptionable, the wood cuts are instructive and the copper plate engravings, colored by hand, are excellent. The present enlarged and partly rewritten edition will doubtless be hailed with the same satisfaction, by every laryngoscopist, that has been accorded to the preceding ones.

Brain Work and Over Work. By Dr. H. C. Wood, Clinical Professor of Nervous Diseases in the University of Pennsylvania, etc. Philadelphia: Presley Blakiston. 1880. 16mo, pp. 126. Price, 50 cents.

This is one of the volumes of the American Health Primers, which were formerly published by Lindsay & Blakiston. The little book before us should be in the hands of all using their mental faculties in their daily labors. It discusses all questions connected with brain work in a forcible and suggestive manner, and we feel confident that all interested in the subject will study it with profit to themselves.

Our Homes. By Henry Hartshorne, A.M., M.D., formerly Professor of Hygiene in the University of Pennsylvania. Philadelphia: Presley Blakiston. 1880. 16mo, pp. 150. Price, 50 cents.

Another volume of the American Health Primers, and one in the subject matter of which every one is interested, since it discusses the all-important question: How shall we have healthy homes? Situation, construction, light, warmth, ventilation, water supply, drainage, disinfection, population and workmen's homes are the topics considered. More than 30 wood cuts have been introduced in illustration of the correct and improper systems of ventilation and drainage.

On the Internal use of Water for the Sick, and on Thirst. A clinical lecture at the Pennsylvania Hospital, October 25, 1879. By J. Forsyth Meigs, M.D., one of the attending physicians to the hospital. Philadelphia: Lindsay & Blakiston. 1880. pp. 54. Price, 25 cents.

The pamphlet which bears on its title page, as a motto, the old English proverb: "Drinking water neither makes a man sick, nor in debt, nor his wife a widow"—discusses a subject of the utmost importance in which all are interested. Though delivered before medical students, this lecture may be read with profit by others, and more particularly by those to whom the care of sick people is intrusted.

Sulphate of Quinia. Statement of the American manufacturers regarding the repeal of the duty on the foreign article. January, 1880. pp. 12

This pamphlet, which we suppose may be obtained from any one of the four manufacturers of quinia in New York and Philadelphia, furnishes much food for thought to the advocates of the hasty and injudicious legislation by which the duty on foreign quinia was repealed.

The Poison Register and Poisons and their Antidotes. By John H. Nelson, Cleveland, Ohio.

As the title indicates, this book is intended for the registration of the sale of poisons. It is conveniently ruled so as to give the date, time, name of poison, quantity, purchaser, residence, witness, etc.; and this is preceded by an account of the various poisons, their antidotes, symptoms and tests, and by a compilation of the various State laws regulating the sale of poisons. The latter are not quite complete, several have been overlooked by the compiler, which were published in the Proceedings of the American Pharmaceutical Association since 1868. Apothecaries will find the book serviceable and well adapted for the purpose for which it is intended.

Deutsch-Amerikanische Apotheker-Zeitung (German-American Apothecaries' Gazette).

The first number of this semi-monthly paper is dated March 15, and consists, exclusive of the advertisements, of 13 large quarto pages. It is edited by Dr. Geo. W. Rachel, and published by the Pharmaceutical Publishing Company, 5 Gold street, at \$2.50 per year. It is very creditably edited, printed upon good paper and in clear type, and, to judge from the initial number, deserves the support of the pharmacists, physicians, chemists and druggists who are conversant with the German language.

Index Medicus. New York: F. Leypold.

This excellent journal has entered upon its second year, and is in reality what it professes to be, a complete classified record of the medical literature of the world. Its price is \$3 per year.

We hereby acknowledge the receipt of the following pamphlets:

The Calendar of the Pharmaceutical Society of Great Britain. 1880. pp. 456.

Valedictory Address to the Graduating Class of the Medical Department of California, by Prof. W. F. McNutt, M.D.

Microscopical Fungi Infesting our Cereals. By Wm. Barbeck. Reprint from the "American Naturalist," October, 1879.

The Sanitation of small Cities. By David Prince, M.D. From "Transactions of the Illinois State Medical Society."

Color Blindness and Defective Sight Among Railroad Employees.

The Fallacies of Popular Clinical Medicine. By Prof. Jarvis S. Wight, M.D., of Brooklyn.

The Anatomical Relations of Uterine Strictures. By T. H. Buckler, M.D., Baltimore, Md.

The New Anæsthetic, the Bromide of Ethyl. By R. J. Levis, M.D., Philadelphia.

Researches on Hearing through the Medium of the Teeth and Cranial Bones. By Chas. H. Thomas, M.D., Philadelphia.

A Plea for Cold Climates in the Treatment of Pulmonary Consumption. By Talbot Jones, M.D., St. Paul, Minn.

Therapeutic Action of Mercury. By S. V. Clevenger, M.D., Chicago.

Nitro-Glycerin as a Remedy in Angina Pectoris. By Wm. Murrell, M.D., M. R. C. P. (from the "Lancet").

Annual Review of the Drug Trade of New York, for the year 1879. By D. C. Robbins.

Sur l'usage et l'abus du Thé et du Café, suivi d'une note sur le Maté. Par Adrien Nicklès. On the use and abuse of tea and coffee, with a note on maté.

This is an interesting communication made to the society for sciences, agriculture and arts of Lower Alsace.

Réponse à une note de M. le Dr. Phipson, intitulée : On the Nascent state of Bodies.
Par le Dr. D. Tommasi.

A reprint from "Revue Hebdomadaire des Sciences."

OBITUARY.

HEINRICH AUGUST LUDWIG WIGGERS, PH.D., Professor of Pharmacy at the university of Göttingen, died in that city February 23d, in the seventy-seventh year of his age. Wiggers was born in the village of Altenhagen, June 12th, 1803, where his father labored as minister. He served his apprenticeship in pharmacy from 1817 to 1822, and in 1827 went to the university of Göttingen to complete his studies. In the following year Professor Stromeyer induced him to accept the position of assistant at the chemical laboratory, in which capacity he labored, since 1835 under Professor Wöhler, until 1850. In 1835 he received the degree of Ph.D., and in 1837 he became private lecturer on pharmacognosy, and in 1846 also on pharmacy. In 1848 he was promoted extraordinary professor, and in 1850 inspector-general of the pharmacies of Hannover in place of Professor Wöhler, whom and his predecessor Stromeyer he had assisted in these duties since 1828. He resigned his inspectorship in Hannover in 1868, but continued to act in the same capacity in the county of Lippe until disabled by sickness. In 1864 he received the title of medical councillor and in 1870 a fund was created by the pharmacists of the province of Hannover, which is known as the Wiggers fund, and used for aiding deserving pharmaceutical students at the university of Göttingen. Early in 1879 he had a severe attack of pleurisy, which developed into dropsy of the chest, the immediate cause of his death.

Wiggers made a number of important chemical investigations, chiefly during the earlier period of his connection with the university of Göttingen. His researches on ergot, pareira brava and quassia are perhaps those best known in America. Of still greater importance are the literary labors of Wiggers, which commenced with the translation from the Swedish into the German language of the last sixteen annual reports on chemistry, commenced by Berzelius and continued by Svanberg, and of Berzelius' Handbook of Chemistry in ten volumes; these translations were made under the supervision of Professor Wöhler. In 1844 he commenced the publication of the celebrated annual report on the progress of pharmacognosy and pharmacy in all countries, in which he also embodied his own observations. This report was at first issued as a part of Cannstatt's Annual Report on Medicine; but since 1866 is published as an independent work, edited since 1874 by Professor Dragendorff.

As teacher of pharmacognosy, he was indefatigable in improving the material for instruction, and acquired a collection of drugs which is regarded as one of the most complete ones in Europe. It is now in the possession of the state for the use of the university, and was used by him in writing the descriptions for his "Grundriss der Pharmacognosie" (Outlines of Pharmacognosy), of which several editions have been published.

Modest and kind in disposition, industrious and conscientious in the discharge of his duties, he was respected and beloved by his pupils, and secured the esteem of the intelligent pharmacists of all countries. By his death the American Pharmaceutical Association and the Philadelphia College of Pharmacy lost one of their most favorably known honorary members.

THE AMERICAN JOURNAL OF PHARMACY.

MAY, 1880.

ETHYL BROMIDE.

BY LAWRENCE WOLFF, M. D.

Read at the Pharmaceutical Meeting April 20.

Progressive medicine has again confronted the pharmacist in this substance with a new remedial agent, which promises fair to stand the test of time much better than the host of new remedies which are almost daily pressed into the ranks of our therapeutic allies, and it is therefore I think it merits closer investigation, in order that it be offered to the medical profession in its highest possible perfection.

In view that already our literature shows a great deal of research and a thorough knowledge of the production of this new agent, I do not claim to here propose radical innovations, but merely desire to call attention to such modifications as will assist in obtaining it in its pure state at the lowest possible price.

Ethyl bromide, the hydrobromic ether of older chemists, discovered by Serullas in 1827, shortly after the discovery of bromine itself, received but little attention as a therapeutic agent until Dr. Nunnally, of Leeds, England, called attention to it as a useful anæsthetic in 1865. Rabuteau, of Paris, again created considerable interest by his experiments with it on the lower animals in 1876, but the credit of bringing it out prominently and, as it now seems, permanently, is due to Dr. Lawrence Turnbull and the hearty co-operation, persevering efforts and experiments of Dr. R. J. Levis, both of this city. The latter has already used it in hundreds of cases, and as yet no untoward accident has occurred at his hands.

Its early preparation by the discoverer was based upon the action of phosphorus on bromine in presence of alcohol, which Personne, in 1861, modified by substituting amorphous phosphorus instead, and which was subsequently more rationally conducted by Prof. Remington. The process of De Vrij, by decomposing potassic bromide with sulphuric acid in presence of alcohol, was an improvement which was

followed out by Dr. Greene, but which never served me, in the proportions mentioned, to obtain any appreciable quantity of the ethyl bromide. •

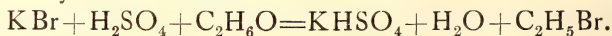
Its chemical composition was early determined to be C_2H_5Br , its specific gravity 1.40, and its boiling point $106^{\circ}F.$; it will not burn, and its vapors even will extinguish flame.

Finding considerable objection to the product of the earlier process on account of its alliaceous odor, probably due to free phosphorus or an ethyl phosphide, I was soon led to produce it by De Vrij's method, which, however, I found deficient in the amount of sulphuric acid, and it was not until I had almost trebled its quantity that I succeeded in completely converting the entire amount of alcohol into ethyl bromide.

The process I employed and, after various experiments and modifications found to answer best, is as follows:

24 ounces of potassic bromide, coarsely powdered, are added to a mixture of 64 ounces of sulphuric acid and 32 ounces of water. After the mixture has sufficiently cooled, 16 fluidounces of alcohol (95 per cent.) are added thereto, the whole placed in a large flask contained in a sand-bath and connected with a Liebig's condenser, heat applied sufficiently that the contents of the flask should be at about $200^{\circ}F.$, and there to be maintained until the reaction, which will go on quite lively for a while, shall have ceased, and the ethyl, which has rapidly been gathering in a receiver containing about one ounce of water, has ceased to come over, as can easily be detected when it fails to further sink to the under surface of the layer of water. The ethyl bromide so obtained will amount to about 20 ounces, and should be shaken with a solution of potassic bicarbonate, subsequently washed with water and purified by redistillation, as described below.

The chemistry of this process is quite plain, the sulphuric acid forming acid potassium sulphate, the bromine taking the place of the oxygen in the ethyl oxide, forming water with the hydrogen present, which expressed in symbols would read as follows:



The operation is in itself so simple, so rapid and so totally devoid of all danger, that its advantages over the earlier ones are readily obvious. It can easily be conducted on the laboratory table of most any pharmacy, and will yield a product which possesses all the characteristics as described above. Its cost is an item of the greatest importance to the pharmacist, in view of the very high price asked for it at one time,

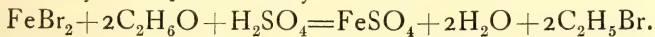
and perhaps yet. The potassic bromide at 68, the sulphuric acid at 15, and the alcohol at 30 cents, will make the expense for material per pound only 90 cents, while any young man can make this amount in two hours' time, besides attending to his various other duties, and it will enable him to emancipate himself from the manufacturing chemist, adding by it to his self-esteem and the elevation of his profession.

But when larger quantities are required, and when it is a matter of importance to reduce the price as much as possible, I have found it to advantage to deviate from the above process, which, however, to the pharmacist may prove most suitable for its preparation on a small scale.

As the first step in the manufacture of potassic bromide is that of ferrous bromide, I made use of the latter at once to obtain the desired ethyl in the following manner :

In a stone jug containing about 1 gallon of water and $2\frac{1}{2}$ pounds of iron turnings or wire, 5 pounds of bromine are gradually added, care being taken not to allow the temperature to rise too high, the jug besides being placed in cold or iced water, and as soon as the reaction has ceased the solution of the green ferrous bromide is filtered off, the remaining iron being well washed out with warm or boiling water, and to it, in a leaden or glass flask (I have found the acid globe of a carboy a most useful vessel), 15 pounds of commercial sulphuric acid are added; after the mixture has sufficiently cooled, 6 pints of alcohol (95 per cent.) are intermixed, the mixture well agitated and distilled at a temperature as in the before-mentioned operation. I have in this way obtained from these amounts 7 pounds ethyl bromide at a cost of material of not over \$4.30, or about 60 cents per pound.

Again, in this reaction the chemistry is quite simple, the sulphuric acid uniting with the iron to form ferrous sulphate, while the two bromine again take the place of two oxygen in the two ethyl oxide, the four hydrogen with the two oxygen of the ethyl oxide forming two water, and may be expressed in symbols as follows :



Although the ethyl bromide thus obtained is by far purer and has less odor than most of the articles found in the market, I have observed that, on evaporating a quantity of it, it left a heavy acrid odor behind which in anæsthesia was bound to prove objectionable if not actually deleterious, and I concluded, therefore, that, after washing, I would re-distill it at a low temperature, which I effected by placing it in a gallon bottle contained in a water-bath and connected with a condenser.

The bath was heated to a temperature of not over 125°F., at which brisk ebullition ensued and a stream of pure ethyl bromide was received, a sample of which I here exhibit, which is devoid of any and all disagreeable odor, colorless and limpid, of a specific gravity of 1.40, boils at 106°F. and does not burn.

The remains in the bottle were about one-half ounce of a brown acrid liquid, which I here exhibit, but of which I have not yet recovered a sufficient amount to make a more complete examination. To the taste it is extremely unpleasant, pungent and representing the disagreeable odor generally found in the ethyl bromide offered in the market.

As regards the stability of pure ethyl bromide, which has been questioned, I can fully confirm Dr. Levis' experience. I have kept samples of my earlier experiments, made almost two months ago, which to-day present the same appearance they had then; and far from a spontaneous decomposition, I have not succeeded, by either alkalies or acids, or other chemical means, to liberate the bromine from this ethyl or to effect its exchange in double decomposition,¹ and cannot say, therefore, that it deserves the name of a loosely molecular article. (Dr. Squibb, "Medical Record," April 3d, 1880, p. 379).

In concluding my remarks on its manufacture, I would point out the simple and cheap manner in which, by my process, a pure and reliable article (which already has been thoroughly tested by many physicians) can be produced by the pharmacist himself, without having to submit to the exorbitant prices generally asked for it.

Actuated by a desire to further study the effects of the ethyl bromide, I was led to make a series of experiments on the lower animals and on ourselves, conjointly with my friend Dr. J. G. Lee, the physician to the Coroner of this city. Regarding the safety of it as an anæsthetic, as well as to after effects produced by its use, we made numerous investigations, the results of some of which I will give condensed below.

As an article from the pen of Dr. J. Marion Sims seems to indicate that a most disastrous result has recently occurred from its use ("Medical Record," April 3, 1880, p. 361), and that being the only and first instance of the kind reported, the ethyl bromide used in that case, as well as the most of it produced heretofore, was presumably obtained in a very imperfect manner, and it seems but reasonable to review the case.

That death occurred only twenty-one hours after the use of the

¹I have since observed a reaction with a strong solution of ammonia, yielding ethylamine bromide.

anæsthetic seems to imply that it was not its immediate presence which caused this lethal effect. The presence of an odor of ethyl bromide forty-one hours after its administration is hardly in conformity with its volatile character, but seems to point to the presence of a heavier and less diffusible substance contained therein.

Judging from these facts that the deleterious effects might be due to the heavy distillate above mentioned, we gave 20 drops of it to a rabbit, with the result of causing gastro-intestinal irritation, general malaise and subsequent death in 18 hours afterwards; while, in the same animal, 30 drops of pure ethyl bromide, given on a previous occasion, produced no worse effects than slight intoxication. A *post mortem* examination showed the decided odor of the acrid heavy distillate pervading the intestinal tract and kidneys, while the brain, which unfortunately in the autopsy of Dr. Sims' case has not been mentioned, presented a congested appearance, explaining probably the cerebral trouble which Dr. Sims' patient complained of so much. This congestion is totally absent in immediate death produced by the anæsthetic on animals, the brain in such contingencies being generally pale and somewhat anemic. The abdominal viscera also showed signs of irritation and congestion.

To further satisfy ourselves as to the effects of pure ethyl bromide, we continued our experiments as follows.

A rabbit of 4 pound 3 ounces weight; anæsthesia induced in one minute by 20 drops of ethyl bromide; pupils first contracted and then dilated; heart acting well, with slight increase in number of beats. By withdrawing and reapplying the anæsthetic as required, the animal was kept under the effects of it for 20 minutes, and on withdrawing it the animal recovered entirely in five minutes.

Another rabbit, weighing $3\frac{3}{4}$ pounds, was made to inhale 1 drachm of ethyl bromide, producing complete anæsthesia in one minute, causing first contraction, followed by dilatation of the pupil; heart beating normally; voluntary muscles relaxed. The anæsthesia being pushed on by the use of another drachm of the ethyl, the beating of the heart was accelerated, number of respirations increased, and in six minutes heart ceased to beat, after losing preceptibly in impulse. Attempts at resuscitation proved fruitless, but electromotoric sensibility well preserved. *Post mortem* examination showed the brain in a state of anemia, lungs pale and healthy, right ventricle and auricle distended and filled with *ante mortem* clots; no odor of the ethyl perceptible after death.

The above experiments demonstrate that with the cautious use of ethyl bromide, rabbits, which are with difficulty maintained in anæsthesia, can be successfully ethylized without much danger to their lives.

Satisfied as to this, we were determined to obtain information as to its action when administered internally, and for that purpose gave to three of the animals respectively 10, 20 and 30 minims of the ethyl. While producing in the larger doses more markedly a slight intoxication, no other serious symptoms arose. Encouraged by this, we commenced taking it ourselves, well diluted, first in doses of 5 and 10, and then 25 and 30 drops, without discovering any noticeable effect, save that of slight sleepiness induced by the larger doses. A nervous headache, existing during these experiments, seems by the ethyl to have been entirely relieved, which however might have been the case had any other bromide been taken instead. That it may prove of decided benefit in nervous irritation and hysteria is readily to be inferred herefrom.

To the taste it is sweet and pleasant, but heating to the mucous surfaces, and it should be well diluted before it is administered.

The next case for experiment was that of a rabbit, which we injected hypodermically with 5 minims of the ethyl, producing, however, no marked effect, save a very slight intoxication. Another, subsequently injected with 10, 15 to another and 30 to still another, had again the effect of producing intoxication, with a decided somnolence and relaxation of the muscles, all of the animals recovering, however, completely within one hour. As a comparative experiment, another rabbit was injected with 15 minims of chloroform, which produced most marked and threatening effects and complete somnolence, from which the animal could not be roused, and only recovered after three hours, remaining for hours afterwards in a stupefied condition.

It is to be remarked here, that in all cases where the animals were injected with ethyl bromide the number of respirations were largely increased.

Determined to ascertain the manner in which the ethyl bromide should prove fatal if injected hypodermically, we injected into one of them, a healthy female rabbit of 5 pounds weight, within half an hour, in broken quantities, $2\frac{3}{4}$ drachms of the article, failing, however, to inflict death, nor more serious symptoms within the next three hours than those above noted; found, however, that the animal had expired during the following night.

A *post mortem* examination revealed a congested brain, but showed nothing beyond that to account for its death.

The inference from these experiments may be set down that, internally as well as hypodermically, the ethyl bromide has no toxic effect on the animal organism beyond that of ether or alcohol.

The absence of any odor of it in intestines, kidneys and liver admits the theory that it is totally eliminated through the lungs; that by its presence in large quantities in the system, and if not readily eliminated through the lungs, it acts as a decided stimulant, and may, when used in excess, like ether and alcohol, cause death by cerebral congestion.

Finally, and with a view to test its adaptability and safety as an anæsthetic in comparison with ether and chloroform, we experimented on three healthy rabbits of about the same weight, simultaneously administering by inhalation to one ether, ethyl bromide to another and chloroform to the third, sufficiently being used to maintain profound anæsthesia.

The first one, under ether, was completely under its effect in one minute; heart's action rapidly increased in number of beats, diminished in impulse, death occurring in 3 minutes.

The second one was in complete anæsthesia from ethyl bromide in 30 seconds; pupils first contracted then dilated; muscles relaxed; accelerated action of heart, gradually failing impulse; death in 7 minutes.

Third rabbit received chloroform, producing rapidly anæsthesia in 50 seconds; heart feeble; at the expiration of 1 minute 50 seconds heart suddenly ceased to beat.

Post mortem appearance showed the animal killed by ether presenting congested membranes and investments of brain, heart apparently arrested in diastole, clot in right auricle and ventricle, which were largely distended; odor of ether thought to be faintly perceptible on opening abdominal cavity; *post mortem* hypostasis well marked in lungs.

Rabbit died of ethyl bromide presented on *post mortem* examination a brain somewhat paler than normal, clots in both ventricles and auricles of heart; death apparently from overstimulation of this organ; lungs normal; no odor of the ethyl perceptible in viscera.

Chloroformed animal showed on *post mortem* examination an anemic brain, small clots in right auricle and ventricle, heart apparently arrested in incomplete systole, due to clot; lungs markedly congested; no odor of chloroform noticeable.

The inferences from these cases seem to impress us as follows:

The first and second rabbits, which had been treated with respectively ether and ethyl bromide, died under similar circumstances. The modes of death appear to have been occasioned by a gradual paralysis of the cardiac inhibitory motor centres, while the sudden heart failure in the third, which is typical of chloroform accidents, seems to indicate paralysis of the cardiac motor centres.

While it is hardly justifiable to infer from experiments on animals as to the effect on the human organism, it is not to be denied that they go far, along with the many trials on human beings and those upon ourselves, to show that a direct toxic influence from pure ethyl bromide on the organism need not be apprehended.

That pure ethyl bromide is *per se* an absolutely safe anæsthetic can as yet not be positively stated, but that its action appears to be quite as safe as ether, and certainly more so than the treacherous and dangerous chloroform, seems to us, as deduction from above-related experiments, out of question.

We can certainly hail this new-comer as another agent destined to alleviate sufferings, which, by its own merits, will win its way into the ranks of those we now hold as recognized measures for combating disease, and as such, propose that by this body it be recommended for a position in the National Pharmacopœia about to be revised.

Philadelphia, April, 1880.

BROMIDE OF ETHYL (Hydrobromic Ether).

BY JOSEPH P. REMINGTON.

Read at the Pharmaceutical Meeting, April 20.

This anæsthetic, which has attracted considerable attention lately, was the subject of a paper by the writer in 1877, which was read before the American Pharmaceutical Association at its meeting at Toronto, Canada. At that time the process which was recommended was a modification of that of Personne, and served well on the small scale to make the preparation experimentally; it was not expected that the demand would at any time be so great as to require a process adapted to a manufacturing scale; but the calls became so frequent that it was found necessary to devise a more practicable method than the one then recommended.

De Vrij's process,¹ which depends upon the decomposition of potassium bromide by sulphuric acid in the presence of alcohol, was again looked to as a basis for a working formula, and the process recommended by Dr. E. R. Squibb² for preparing hydrobromic acid by distilling from a mixture of potassium bromide, sulphuric acid and water, suggested a plan by which the contamination of ordinary ether could be avoided, and this process was subsequently recommended by Dr. Greene.³

In a series of experiments intended to ascertain practically the process which could be adopted if it be deemed advisable to introduce the new agent into the U. S. Pharmacopœia, the following is selected as the best (cut of the apparatus will appear in the next number):

Potassium bromide (not powdered),	58 parts.
Sulphuric acid, sp. gr., 1.838,	44 "
Alcohol (clean) 95 per cent.,	44 "
Water,	28 "

Pour the water into a flask having double the capacity of the liquid ingredients above, and gradually add the acid; when the liquid has become cool add the potassium bromide, and having placed the flask in a sand-bath, adjust a thermometer, and with a bent glass tube connect the flask with a well cooled condenser, insert a narrow glass tube in the cork of the flask, and by means of a short rubber tube connect it with a narrow glass tube which is terminated by a syphon; the shorter limb of this syphon is inserted in the bottle containing the alcohol, which is elevated three feet or more above the flask. Heat the contents of the flask to 116°C., and having attached a screw pinch cock to the short rubber tube of the syphon, allow the alcohol to drop or flow in a small stream into the flask, carefully regulating the rate of flow so that the temperature should not fall below 100°C., nor rise above 116°C. When all the alcohol has passed into the flask continue the distillation until the temperature rises to 116°C., and then disconnect the receiving flask. Agitate the distillate with an equal bulk of distilled water, to which has been added five parts of solution of soda (or sufficient to render the liquid slightly alkaline), and when the mixture has clearly separated into two layers, pour off the upper-

¹Watts' "Dictionary of Chemistry," vol. ii, p. 528.

²"American Journal of Pharmacy," March, 1878, p. 116.

³"American Journal of Pharmacy," June, 1879.

most layer, and having introduced the heavier liquid into a clean flask containing a few fragments of chloride of calcium, redistil it.

Bromide of ethyl is a colorless, very volatile liquid, not inflammable, having an agreeable odor, and a hot, saccharine taste. Its specific gravity is 1.420. It boils at 40°C. (104°F.). It is very sparingly soluble in water, freely soluble in strong alcohol and ether. When a small portion is evaporated from a porcelain plate by causing it to flow to and fro over the surface, little or no foreign odor is yielded as the last portions pass off, and the plate is covered with a slight deposit of moisture.

GUM-HOGG.

By CHAS. L. MITCHELL, PH.G., M.D.

Read at the Pharmaceutical Meeting, April 20th.

Under the above title a peculiar form of gum is described in the U. S. Dispensatory, p. 1664; it was obtained from the establishment of Messrs. J. B. Lippincott & Co., where it was used in one of the processes for the manufacture of books. As described by Dr. Wood, "it is in lumps of various sizes, from that of a chestnut to that of a walnut or larger, of an extremely irregular shape, often much contorted, appearing frequently as if consisting of several pieces which had become agglutinated in their soft state, translucent and nearly colorless, with a slight reddish-yellow tint in some places, of a rather dull though somewhat shining surface, very hard, brittle, with a glassy fracture, inodorous and nearly or quite tasteless. With water it swells to a soft transparent mass, which retains this condition long without change, and if now stirred, instead of forming a consistent mucilage, breaks up into minute, irregular, transparent fragments, which retain this form indefinitely."

Chemically examined by Prof. Wm. Procter, Jr., it was found to be only very slightly soluble in water, both cold and hot, the solution giving a precipitate with sol. subacetate lead, but none with oxalate of ammonium, in the latter respect differing from gum arabic. The insoluble portion was dissolved by strong sulphuric acid, and was converted by boiling dilute sulphuric acid into a soluble gum. He considered the insoluble substance to be bassorin, the insoluble constituent of tragacanth, and the gum itself probably the same as Bassora gum. The gum was obtained from the East Indies, but its botanical source was unknown.

The attention of the writer was recently called to this article, and a few experiments and a number of inquiries made with a view to determine its true relation to Bassora gum. A quantity of the drug was accordingly obtained from the same house which furnished the specimens to Dr. Wood. Upon examination it does not present quite the same physical characteristics which are described by him, but appears to be more a collection of gums from different species bearing a general similarity to tragacanth. It occurs in fragments of irregular shape and varying from the size of a chestnut to much larger; its color in different samples varies from a dirty white to a yellowish brown; it is hard, inodorous, tasteless, and breaks with a short glassy fracture. Some fragments have still adhering portions of the bark of the tree from which it has been obtained, while the general appearance of the gum shows it to have been deposited in successive exudations, similar to tragacanth.

A portion of the gum was set aside with a quantity of cold water, when, after the expiration of twenty-four hours it had swollen up into a soft, white, transparent mass, occupying the lower half of the vessel. When agitated, this mass showed no disposition to form a uniform mucilage, but separated into small, soft, transparent, and rather granular fragments resembling pounded ice; this subsided to the bottom of the vessel again when it was set at rest. The whole was now thrown on a filter, and the filtrate examined; it gave a very faint precipitate with sol. subacetate lead, and no reaction whatever to solution oxalate ammonium; it was neutral in reaction and had neither taste nor smell.

A second portion of the gum treated by prolonged boiling with water gave the same result as obtained with cold water. The insoluble portion was next examined. Alcohol and ether had no solvent action upon it; boiled with dilute sulphuric acid it was soon dissolved, the resulting solution showing no reaction with tincture of iodine, and not responding to Trommer's test for sugar. When boiled with a weak solution of an alkali or alkaline carbonate it was speedily converted into a uniform thick mucilage of a pinkish color. When this was treated with an acid it did not again precipitate, although the mucilage lost its color and became perfectly transparent. The loss of color may be probably accounted for by the presence of iron in very small quantity. These tests, with the exception of perhaps the last, on which there is little information, correspond with those for bassorin, and show the close similarity of the present gum with that previously described by Dr.

Wood, and to the Bassora gum of other writers, and they are all probably identical and the same.

While the solubility of bassorin in alkaline solutions has been but briefly alluded to in various works, it seems to indicate certain properties which might almost entitle it to be considered as an acid similar in its nature to the arabic or gummic acid of gum acacia.

Its commercial history is quite interesting. It was brought into this country about thirty years ago at Salem, Mass. At that time Salem was the headquarters of the East India trade, and this gum came with a lot of tragacanth imported to that place from Calcutta. It was supposed that it might be used in place of tragacanth as a cheaper article by the shoe manufacturers of Lynn and others. It came, however, into the hands of a noted drug garbler of the place by the name of Whipple, and was rejected by him immediately as an unsuitable and inferior gum. It was next shipped to Boston for sale, and after a number of ineffectual attempts to foist it on the market (for its worthlessness soon became known), was finally put up at public auction and sold for two or three cents a pound to Geo. Loring, at that time one of its principal booksellers. Mr. Loring made a number of ineffectual attempts to utilize it for different purposes, and finally, rather disgusted, placed it in the hands of a Prof. Jackson, a chemist of Jamaica Plain (one of the suburbs of Boston). Prof. Jackson experimented with it for some time, and discovered its property of forming a good non-adhesive mucilage when boiled with an alkali, and being quite intimate with Mr. Loring, they soon utilized it for the manufacture of marbled paper, which was just then commencing to be known in the country. Gradually the secret became known, and as there was a slight demand for the article, at different times small lots were brought into the country. Up to the time of Jackson's experiments the gum had received no name, but afterwards it was known through the trade by the name of gum-hogg, and it is believed he gave it this name on account of its obstinacy in resisting the different efforts for its solution, and thus behaving like a well-known domestic animal of similar perverse and wilful habits.

The different gums varied very much in price, being at various times from 25 cents to \$1.25 per pound, and I have been informed by those who have used the article for a number of years, that the character and similarity of the specimens varied as much as its price. They all seemed, however, to have a certain resemblance to tragacanth. The

mucilage formed by this gum possesses no adhesive qualities, and thus is well fitted for its peculiar use, although not superior to similar mucilages obtained from flaxseed, elm bark, quince seed, etc.

Of late years, it has gone considerably out of use on account of the irregularity and scarcity of the supply, being substituted by some of the other mucilages before mentioned.

From all these facts, the writer concludes, that gum-hogg is not the product of any particular tree or plant, but is a *trade-name* applied to various cheap and inferior gums, all probably identical with Bassora gum, and containing and consisting almost entirely of bassorin.

In this connection, before concluding, it might be interesting to give a short account of its use in the manufacture of books. The process in which it takes a part is, that of "marbling," as it is termed, which consists of staining paper and the edges of books in a peculiar and variegated manner. The gum is first allowed to soak in cold water until swollen, and then boiled with a weak solution of pearlash until a thick consistent mucilage is obtained, which is strained. This forms the basis or vehicle for receiving the colors and transferring them to the paper, and is placed in a shallow tank on legs; the tank being about five feet long, three feet wide, and four inches deep. This body must be renewed as often as fermentation in the mucilage renders it liquid; in cold weather this is not so frequent, but in hot weather it must be replaced with fresh at least twice daily. The colors used are the ordinary paint colors, ground to a cream with thin mucilage of gum arabic. The workman, standing over the tank, first takes a large brush with spreading bristles, and dipping it in his color, sprinkles it over the surface of the tank by twirling the handle between his hands. The value of the mucilage is now shown, for the color does not either mix with it, or spread over its surface, but retains the circular form the drops would assume upon first striking a plane surface. The first color is then followed in a similar manner by a second, using a fresh brush, and this in turn by a third, and so on at the pleasure of the operator, each particular drop showing no disposition to mix with its fellow. The pattern thus made is mostly of round drops, but should it be desired to vary it, combs of different degrees of fineness are drawn in different directions gently over the surface, producing beautiful wavy lines and figures. The paper is now floated gently upon the surface of the tank for a few seconds, when the color is transferred from its surface to that of the paper, and after being hung to dry is burnished by hot steel rol-

lers. No particular quality of paper is needed, the only requisite being, it should not be too highly calendered. A smooth piece of board is now drawn over the surface of the tank when it is ready for a fresh operation. The edges of books are stained in a similar manner; the book being taken unbound and pressed between boards tightly together so that none of the color shall penetrate beyond its surface; they are afterwards when dry, burnished with a hot iron tool by hand. The products afforded by this process are of infinite variety, and, as can be imagined, no two products are ever exactly alike, and by varying the colors an almost endless and kaleidoscopic change can be produced.

Philadelphia, April 20, 1880.

IMPROVED TROCHE BOARD AND ROLLER.

BY FRANCIS E. HARRISON, PH.G.

From an Inaugural Essay.

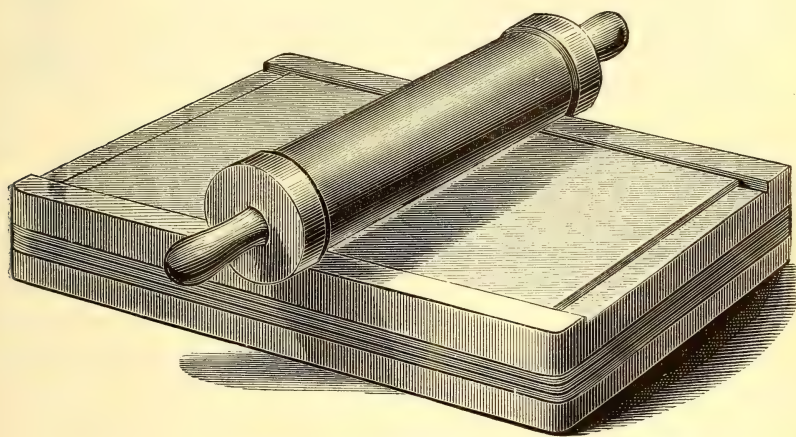
The demand for troches having of late so largely increased, it has become necessary that we should seek some means of facilitating their manufacture. With a view to that end, I have devised an entirely new form of board, which I think will obviate the objectionable points of the one now generally in use. The present board is similar to that used by housekeepers as a bread or pie board, with the addition of two strips, one of which is tacked upon each side of the upper surface, within the range of the roller; so that when the medicated mass is rolled it will be reduced to the thickness of the space intervening between the roller and the board. Such an arrangement answers very well for troches of one thickness, but, as different troches vary in thickness, such a board is of only limited use, and it may be necessary to have a different one for each kind of troche; or, when using only one board, to change the strips in each case, unless the operator relies chiefly on his skill in rolling a mass to a uniform thickness without such mechanical guides.¹

The following is a description of the troche board devised by me, upon which all sizes of troches can be made:

The Board is 16 inches long, 11 inches wide and $\frac{3}{4}$ of an inch thick; attached to it on the under surface are two beveled pieces, 11 inches in length, so as to run entirely across the board; these pieces are $\frac{3}{4}$ of

¹ An improved troche board was described by F. L. Slocum in "*Amer. Jour. Phar.*," 1879, page 589.—EDITOR.

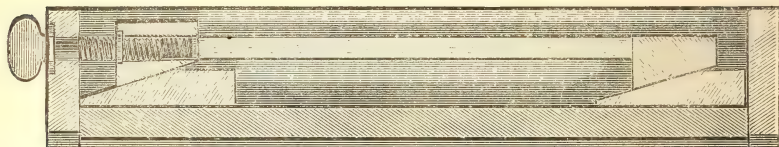
an inch on one edge, tapering to $\frac{1}{8}$ of an inch on the other, and are firmly attached to the board, one on each end, the bevels both tapering in the same direction. The board is surrounded by a frame, 1 inch thick, 3 inches in height on the sides, and $2\frac{5}{8}$ inches upon the ends, so



TROCHE BOARD AND ROLLER.

that the sides project $\frac{3}{8}$ of an inch above the ends. There is a second frame inside the outer one, and beneath the board, which is made to move back and forth in two grooves cut in the outside frame, one on each side; upon this inner frame there are two beveled pieces firmly secured, and corresponding to the strips attached to the board. When the inner frame is caused to move forward (by a screw which is fastened by a plate upon the frame) the beveled strips attached to the inner frame press against the beveled strips attached to the board, and by continued force the board is caused to ascend in the frame; by turning the screw in the opposite direction the frame is drawn back to its former position and the board falls again, in a horizontal direction. It is impossible for the frame to spring from its position, as it is firmly held by the grooves. The board may be taken out at will and cleaned after use. The beveled strips serve to keep the board from twisting. The board can be raised or lowered $\frac{3}{8}$ of an inch, the entire capacity; it requires 15 complete revolutions of the screw to raise it the entire distance, or 40 to the inch; by turning the screw but one-half of a revolution the board is raised $\frac{1}{80}$ of an inch, and, in fact, any desired

height may be obtained. This troche board forms a neat and attractive piece of furniture for the store, there being no projections to interfere with the working of it.



SECTION OF TROCHE BOARD.

The Roller is so constructed that the handle forms a continuous piece, running through a hole $\frac{3}{4}$ of an inch in diameter; thus the handles can be firmly held while the roller revolves. Upon each end of the roller there is a flange, $\frac{3}{8}$ of an inch high and 1 inch wide, keeping the roller in place upon the board, and preventing the surface of the roller from becoming soiled or bruised as the flanges raise it from the point of contact.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

Mercury and Soft Paraffin.—E. Dietrich corroborates the statement of Dr. Weber, that mercury may be readily extinguished with vaselin under certain conditions, but states that under the same conditions an excellent ointment can be prepared with lard, simple cerate, old ointment, etc., which shows that vaselin, although much more expensive, possesses no advantages whatever over the other vehicles; on the contrary, old ointment is by far preferable, because the smallest quantity of it is required to kill the cohesion of the mercury, as can be proved by mixing 50 parts of it with 100 parts mercury, when it will yield quite an uniform and satisfactory ointment, which is not the case with any of the other vehicles, including vaselin.—*Pharm. Ztg.*, Feb. 28, 1880, p. 125.

E. Dietrich's New Mustard Plasters are spread on paper, shirting and silk, and are highly recommended by C. A. Jungclaussen, who states that while being fully as flexible as American mustard plasters, they are much quicker and energetic in their action. He further remarks, that by extracting an American mustard plaster with petroleum ether, decanting, and washing the residue, Dietrich

obtained as a residue 3·2 powdered mustard, deprived of its oil, while the decanted solution evaporated left a soft residue, which, when treated with acetic ether, yielded 0·167 caoutchouc and 0·5 fatty oil, thus proving that the powdered mustard used contained 13·5 per cent. objectionable fatty oil, which, in connection with the caoutchouc, increases the flexibility and adhesiveness of the plaster, but decreases its rubefacient power and promotes rancidity. Dietrich's improved method of preparation is not published by Jungclaussen, but probably differs from the American only in using mustard deprived of all its fixed oil.—*Ibid.*, Feb. 25, 1880, p. 117.

Dr. Heller's Caustic Pencils consist of long, thin sticks of lunar caustic, encased in wood; they look like ordinary lead pencils, and are resharpened like the latter whenever the point is worn off. A metal cap is used for protecting the point, when carried. The pencils are well adapted for cauterizing the throat, whenever the application of nitrate of silver is desired.—*Ibid.*, Feb. 11, 1880, p. 86.

Artificial Karlsbad Salt is made by Dr. Brunnengraeber by mixing 100 parts of sodium sulphate, 70 parts of sodium bicarbonate, 40 parts of sodium chloride and 5 parts of potassium sulphate, all coarsely powdered. This mixture is dispensed in bottles having a hollow wooden stopper, which, holding just 6 grams (which is sufficient for making 1 liter of Karlsbad Water), serves as a handy measure for the consumer.—*Pharm. Centralb.*, Feb. 26, 1880, p. 73.

Karlsbad Salt (see also "Amer. Jour. Pharm." 1878, p. 474; 1879, p. 454; 1880, p. 133).—*Genuine* Karlsbad Salt contains, according to *Ragsby*: Traces of potassium sulphate, 85 parts of crystallized sodium sulphate, 15 parts of crystallized sodium carbonate (probably sesquicarbonate), and 0·4 parts of sodium chloride.—*Artificial Karlsbad Salt* is made by *Schlickum*, in close imitation to the above by dissolving in 12 parts of lukewarm water: 1 part of sodium chloride, 1 part of sodium bicarbonate, $1\frac{1}{2}$ part of neutral sodium carbonate, and 6 parts of crystallized sodium sulphate, decanting the clear liquid, setting aside at 8° to 10°C. for crystallization, and stirring several times while crystallizing; on decanting the first mother-liquor, dissolving in it 3 parts of Glauber salt, and again allowing to crystallize, a second yield is obtained.—*Pharm. Ztg.*, Feb. 14, 1880, p. 93.

Pure Hydriodic Acid.—C. Winkler dissolves iodine in carbon bisulphide in a tall glass cylinder, adds sufficient water, which forms a distinct layer on top of the deep violet-colored solution of iodine, and

passes a stream of hydrogen sulphide through the latter solution. The iodine is converted into hydrogen-iodide, and this is absorbed by the supernatant water, forming aqueous hydriodic acid, while the separated sulphur is dissolved by the carbon-bisulphide, forming a heavy oily solution. As soon as the violet solution of the iodine acquires a wine-yellow color the transformation is complete, the two distinct layers are separated, and the aqueous hydriodic acid is boiled for a few minutes in order to expel hydrogen sulphide if present; it is then chemically pure, and can be used for preparing the various iodides.—*Schw. Wochenschr. f. Pharm.*, Feb. 13, 1880, p. 54, from *Fabresber. d. Phys. Ver. z. Frankf.*

Borocitric Acid and its Salts.—Ed. Scheibe proved that citric acid forms with boracic acid a soluble compound, the two constituents always uniting in the proportion of 2 molecules of citric and 1 molecule of boracic acid. The corresponding proportions by weight are: 1 part by weight of boracic acid, and 7 parts of citric acid. Borocitric acid can be prepared either by adding the boracic acid, with constant stirring, to a solution of the citric acid in boiling water, or by adding the citric acid to the boracic acid suspended in boiling water, and continuing to heat until a complete solution is obtained, or by mixing both acids with water, and heating. On evaporating an aqueous solution of borocitric acid to dryness, a solid, amorphous, light gray mass is obtained, which is readily soluble in water and in strong alcohol. When subjected to dialysis it dialyzed unaltered. While evaporating, some of the boracic acid volatilized with the water. By allowing a very concentrated solution of borocitric acid to evaporate very slowly, the acid was obtained as a decidedly crystalline fibrous mass. The crystalline borocitric acid differs from the amorphous only in being less compact and having a snow-white color; in all other respects it closely resembles the amorphous acid into which it is soon transformed, even when kept in closed vessels. Both compounds are not altered by the air, unless the atmosphere is very moist, when they deliquesce. The borocitrates of the alkalies are permanent salts, soluble in water, while the salts of the heavy metals are partially soluble in water and partially insoluble, the boracic acid apparently not being combined very firmly. All salts of borocitric acid color turmeric paper brownish-red, and are decomposed by stronger acids, which separate the boracic acid. *Potassium biborocitrate* is the only salt which has been obtained in crystals so far.—*Phar. Zeits. f. Russland*; *Schw. Wochenschr.*, Feb. 13, 1880, p. 50-53.

Morphia Muriate.—The extensive investigations of Dr. H. Tausch prove that:

1. The commercial morphia muriate is very rarely chemically pure, but usually contains a varying percentage of resinous substances.

2. When morphia muriate is dried for some time, and the heat is raised to $100^{\circ}\text{C}.$, it not only loses the hydrochloric acid, adhering to it mechanically, but also its total water of crystallization, and it is therefore necessary to prescribe either the morphia muriate dried in the air, and therefore containing water of crystallization, or the morphia muriate dried at $100^{\circ}\text{C}.$, which contains no water of crystallization, but about 15 per cent. more alkaloid than the former.

3. Pure morphia muriate when heated at 130° is not altered, while the impure commercial salt exhibits a brown or even black coloration.

4. In all cases in which morphia muriate is to be used, it is important to remember that the 1 molecule of water of crystallization, with which it separates from its solutions, can be removed by heating to 100° .—*Ztschr. d. Allg. Oest. Apoth. Ver.*, Feb. 10, 1880, p. 65–69, and Feb. 20, 1880, p. 82–85.

Morphia Muriate, relation of Bulk and Weight.—The apparent difference in weight and the plainly-visible difference in bulk of different lots of commercial morphia muriate were hitherto considered due to a difference in the percentage of moisture or water contained in the different lots. Hager recently reinvestigated the cause, and found that this depends solely upon the difference in the size of the crystals. *Pharm Centralb.*, Feb., 12, 1880, p. 55.

Monobromated Camphor.—C. C. Keller dissolves 300.0 camphor in 150.0 or 180.0 chloroform, filters the solution into a large tubulated retort, adds 320.0 pure bromine, and sets aside for several hours in a cold place until a crystalline paste of camphor dibromide, $\text{C}_{10}\text{H}_{16}\text{OBr}_2$, is formed; the tubulure of the retort is now closed with a safety tube, and heat is applied by means of a water-bath, when the camphor dibromide is decomposed into monobromated camphor and hydrogen bromide, the latter escaping, a portion of the chloroform and a little bromine distilling over at the same time. After being heated for 2 or 3 hours the dark brown colored contents of the retort turn light yellow. When but minute portions of hydrogen bromide vapors escape, the retort is removed from the water-bath and is allowed to stand in a cold place for about 24 hours, when the monobromated camphor separates in light yellowish crystals, which are freed from the mother-liquor,

washed with a little absolute alcohol, until they appear white, then recrystallized from ether, and, in case the solution was acid, are washed with solution of sodium carbonate, and then recrystallized from alcohol. By evaporating the wash-water and the etherial mother-liquor, another small yield of monobromated camphor is obtained. The total yield obtained by the author from 300·0 camphor amounted to 340·0 grams. The liquid, which distils over, and consists of hydrobromic acid, bromine and chloroform, may be decolorized with sulphuretted hydrogen, and utilized for making potassium bromide or some other bromide.—*Schw. Wochenschr. f. Pharm.*, Feb. 13, 1880, p. 50.

Theobromina, from Cacao Shells, is obtained by Donker, Treumann and Dragendorff, by extracting them with boiling water, filtering, expressing, precipitating with subacetate of lead, removing the lead with sulphuric acid, filtering, concentrating, evaporating with calcined magnesia, and extracting the residue with 80 per cent. alcohol, which extracts the theobromina. This is then purified by recrystallizing from water. By this process 4 to 5 kilograms of shells yielded 13·5 grams of colorless theobromin.—*Pharm. Ztg.*, Feb. 28, 1880 p. 125, from *Jahresber ueber d. Fortschr. d. Chem.*

Gastrolobin, a New Glucoside.—By extracting the leaves and young branches of *Gastrolobium bilobum* with boiling water, treating the evaporated extract with alcohol in order to remove gummy substances, separating the aqueous solution from a blackish resin, precipitating with neutral lead acetate after adding a little free acetic acid, decomposing the lead precipitate by dilute nitric acid, filtering, evaporating the filtrate, redissolving the extract, again precipitating with lead subacetate, washing the precipitate, decomposing under water with sulphuretted hydrogen, and evaporating the liquid to dryness, F. v. Mueller and L. Rummel obtained "gastrolobin," as a blackish, brittle, hygroscopic substance, having an odor and taste resembling sassafras, soluble in hot water and alcohol, precipitated from the aqueous solution by lead subacetate, readily decomposed by boiling with mineral acids, and partially with organic acids, and dissolving in liquor ammoniæ, forming an intensely yellow solution. The authors obtained a yield of 1 per cent. glucoside from the dried herb, but consider it possible that the blackish resin mentioned above is a decomposition product of gastrolobin; whether the latter is the poisonous principle of the herb must be determined by future investigations. A similar poisonous principle has been found in other species of *Gastrolobium*, in *Oxylo-*

bium, in *Isotropis striata*, *Bth.*, etc.—*Ztschr. d. Allg. Oest. Ap. Ver.*, Feb. 20, 1880, p. 81.

An Adulteration of Powdered Cloves, with a large percentage of stems, a little starch, and a fatty oil, the latter of which had been added by the wholesale dealer in order to impart a darker color to the powder, is reported by E. Heintz, who further states, that the odor and taste of the cloves were as usual, that the stems and starch were detected by means of a microscope, and that, when the cloves were treated with carbon bisulphide, 19 per cent. of a substance was extracted which on evaporation was found to consist principally of fatty oil.—*Pharm. Handelsbl.*, Feb. 11, 1880, p. 6.

False Quebracho Bark (see also "Am. Journ. Pharm.," April, 1880, p. 202).—This bark is found in the German market in large quantities, and is described by Dr. J. Biel, as follows: It consists of pieces of different length, $\frac{1}{2}$ to 2 inches in width, 2 to 5 millimeters in thickness, usually rolled, and covered externally with the yellowish-white periderm which exhibits numerous deep longitudinal furrows and faint transverse fissures; internally the bark is dark brown. The fracture appears in the outer bark granular, and in the inner bark long-fibrous; the taste is bitter, but not aromatic. The outer bark consists of numerous regular layers of tabular leathery cork cells, covering an equally thick spongy cork layer, composed of tangentially stretched wide and thin-walled cells. A light, continuous circle of stone cells, with strongly thickened walls, forms the inner limit of this layer, and can be seen with the naked eye. The middle bark consists of parenchyma cells, filled partially with a dark brown substance, and besides contains scattered groups of 10 to 20 stone cells and scattered bast-cell bundles, which are more numerous towards the inner layer, and finally form the inner bark, consisting almost entirely of these bast-cells, and of narrow, radially placed medullary rays, containing a dark substance.—*Pharm. Ztg.*, Feb. 25, 1880, p. 118.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER.

Inorganic Chemistry.—*On the Artificial Formation of the Diamond.*—J. B. Hannay, in the course of an elaborate investigation made jointly with J. Hogarth, on the solubility of solids in gases, has succeeded in obtaining carbon crystallized in the form of the diamond. He noticed

first that many bodies, such as silica, alumina and oxide of zinc, which are insoluble in water at ordinary temperatures, dissolve to a very considerable extent when treated with water-gas at a very high pressure. It occurred to him that a solvent might be found for carbon, and as gaseous solution nearly always yields crystalline solid on withdrawing the solvent or lowering its solvent power, it seemed probable that the carbon might be deposited in the crystalline state. Ordinary carbon, such as charcoal, lampblack or graphite was found not to be acted upon. It was found, however, that carbon could be gotten in the nascent state by the following reaction. When a gas containing carbon and hydrogen is heated under pressure in presence of certain metals, its hydrogen is attracted by the metal and its carbon left free. When the carbon is set free in presence of a stable compound containing nitrogen, the whole being near a red heat and under a very high pressure, the carbon is so acted upon by the nitrogen compound that it is obtained in the clear transparent form of the diamond. The carbon so obtained is as hard as natural diamond, scratching all other crystals, and it does not affect polarized light. The crystals have curved faces belonging to the octahedral form; they burn easily on thin platinum foil, leaving no residue, and after two days' immersion in hydrofluoric acid they show no sign of dissolving even when boiled.—*Chem. News*, March 5th, 1880.

Dissociation of Chlorine, Bromine and Iodine.—The first results of Victor Meyer on this subject have already been noted (this JOURNAL, Sept., 1879). J. M. Crafts has repeated these experiments, working with slightly modified apparatus. Using free chlorine, instead of the nascent chlorine evolved from platinum chloride, he found no change in the vapor density of the gas even at the highest temperature of the furnace. With iodine, however, he did find the change in vapor-density referred to by Victor Meyer, viz, a reduction to two-thirds the normal value. With bromine he got results giving a value intermediate between the normal and the two-thirds value.

Victor Meyer and Lüblin now publish results obtained by them prior to the publication of Craft's paper bearing upon the same subject. They found also that free chlorine gave a normal density under all changes of temperature, so that it is only when nascent chlorine is tried that the abnormal density or dissociation, as they view it, is gotten. Iodine, however, taken in the free state, showed dissociation at all temperatures over about $1,000^{\circ}\text{C}$. With bromine, if the free element

was taken, great difficulty was experienced in getting satisfactory determinations, owing to its volatility. The results agreed in general with those of Craft's. When the bromine was liberated in the nascent state from platinic bromide, PbBr_4 , they got results agreeing exactly with $\frac{2}{3} \text{Br}_2$, showing dissociation. They say nothing as yet of the nature of the dissociation products of the three halogens.—*Nature*, March 18th, 1880, p. 461.

Manufacture of Glauber's Salt in the south of France.—The following interesting description of the extraction of Glauber's salt from the sea-brines, as now practiced at the large salines at the mouth of the Rhone River, contains several items of interest to the chemist.

The sodium sulphate is obtained by decomposing a liquor which contains common salt and magnesium sulphate in proper proportions by the aid of artificial cold. The Carré ice machine is used for this purpose. The crude material, the *sel mixte*, crystallizes out at a certain stage in the evaporation of the mother-liquor left after common salt has crystallized. This special liquor is then cooled by an ingenious application of the refrigerating process until -6°C . is reached, when Glauber's salt separates out as a crystalline scum, which is removed and carried by elevators to large draining casks. Here the salt is freed from adhering water and is now ready to be made anhydrous. This operation had given great difficulty, as the evaporation in iron pans was not possible, on account of the tendency of the separating anhydrous sulphate to burn, and calcination with the aid of a reverberatory flame was also extremely difficult to carry out. The difficulty has been overcome very simply. The water of crystallization is not driven off by heat, but is displaced. For this purpose the crystallized Glauber's salt, in quantities of 1,500 kilograms, is fused with a small amount of the mother-liquor in a wooden tank heated by a copper worm and provided with stirrers, when 250 kilos of common salt are added. In the degree that the salt dissolves, anhydrous Glauber's salt is precipitated, and at the end of the operation about 85 per cent. of the Glauber's salt originally used is gotten as an anhydrous precipitate. The salt so obtained has at most 0.5 per cent. sodium chloride and 5 per cent. of water present.—*Chem. Industrie*, Jan. 1880, p. 9.

Organic Chemistry.—Extraction of Fresh Flower Perfumes with Methyl Chloride.—C. Vincent, who has prepared methyl chloride recently in such large amount from the residues of beet-root molasses (this JOURNAL, March, 1879, p. 126) has made experiments on a large

scale as to its use as a means of extracting the perfume of flowers. Using this solvent, which evaporates at very low temperature, for extraction in closed vessels, the perfumes are obtained perfectly unaltered and in fresh condition, mixed with fat and wax-like substances. This mixture gives up to alcohol the perfume perfectly pure. The methyl chloride, to be used for this purpose, must be previously treated with concentrated sulphuric acid, to free it from traces of a bad-smelling compound which may sometimes accompany it.—*Ibid.*, Feb., 1880, p. 59.

On the Reaction of Ferric Chloride with Salicylic, Carbolic, Gallic and Tannic Acids.—H. Hager gives the following means of distinguishing between these acids by the aid of the ferric chloride test. The substances which interfere with the violet coloration which ferric chloride gives with these acids are numerous, and by noting them we may obtain a clue as to which of the acids may be present in a solution. Thus with *salicylic acid* the reaction is not disturbed or hindered by the presence of acetic, boracic, sulphuric, nitric or hydrochloric acids (all acids in dilute condition), common salt, nitre, glycerin, alcohol, amyl alcohol or ether. It is hindered by caustic alkalies, alkaline carbonates, sodium acetate, ammonium acetate, borax, potassium iodide, sodium phosphate, oxalic, citric, tartaric, phosphoric and arsenic acids. With *carbolic acid* the reaction is not hindered by boracic acid, common salt or potassium nitrate. It is hindered by acetic, oxalic, tartaric, citric, sulphuric, hydrochloric, nitric and phosphoric acids, sodium acetate, ammonium acetate, borax, sodium phosphate, glycerin, alcohol, amyl alcohol and ether.

Phosphoric acid decolorizes both with salicylic and carbolic acids and with gallotannic and gallic acids as well. The officinal sodium phosphate, however, hinders the reaction with salicylic and carbolic acids, but not with tannic and gallic acids.

For a preliminary distinction between salicylic and carbolic acids the solution is to be treated in abundance with alcohol or glycerin, or with dilute acetic acid, and then tested with ferric chloride. Salicylic acid will give the reaction, carbolic acid will not.

To distinguish whether gallotannic or gallic acid be present, add sodium phosphate to the solution, and then test with ferric chloride. The violet coloration will show their presence, but is not produced by salicylic or carbolic acids.—*Dingler's Polytechn. Jour.*, 235, p. 407.

Note on the Action of the New Diastase, Eurotin, on Starch.—R. W.

Atkinson, Professor of Chemistry at Tokio, Japan, describes the action of the ferment which the Japanese use instead of malt in brewing processes. The fermenting body is called Koji, and is prepared as follows: Washed rice is soaked in water until soft; it is then steamed for some hours, until the starch has gelatinized. When lukewarm, the mass is sprinkled with spores of the fungus *Eurotium oryzae*. The grains are then well mixed and exposed in trays to a temperature of about 25°C. In three days the mass is cemented together by the silky filaments of the mycelium and forms the "koji" which is used instead of malt in the brewing process. When extracted with water, koji yields a solution reducing the Fehling test. When digested with water for about ten minutes the solution gives about 12 to 14 per cent. of glucose. Korschett has shown ("Dingler's Polytech. Jour.," 230, p. 76) that the cold aqueous extract of koji has properties resembling those of malt, and when added to gelatinized starch renders it limpid and forms sugar. He also concluded that the temperature of 40° to 50°C. was the most favorable to this change. The author of the present paper comes to the conclusion that the starch breaks up in this process into glucose and dextrin instead of maltose and dextrin, as in our mashing operations.

A mixture of koji, steamed rice and water is made in the cold. On the 5th to the 7th days the mash is warmed by introducing tubes filled with hot water. Further additions of steamed rice and water were made between the 14th and 17th days, and again on the 18th day, a fourth addition of steamed rice, ferment and water took place. The mash was then pressed, and during the interval the small quantity of dextrin underwent fermentation, and the specific rotatory power of the filtered liquid became almost *nil*. The filtered liquid (Saké), which contains the water used to rinse out the fermenting tubes, contains 11.14 per cent. alcohol; glycerin and resin, 1.99; fixed acid, 0.13; volatile acid, 0.02; water, 86.72. The fermentation is probably spontaneous. The size of the ferment cells is a little less than that of beer yeast.—*Chem. News*, April 9, 1880, p. 169.

THE DIFFUSIVE PROPERTIES OF SOME PREPARATIONS OF IRON.

BY PROFESSOR REDWOOD.

Attention has recently been directed to the properties possessed by

¹ Read at an evening meeting of the Pharmaceutical Society of Great Britain, March 3, 1880.

oxide of iron as it exists in dialyzed iron, and founded on the observation of these properties it has been inferred that dialyzed iron is a very inert preparation. The iron exists here in what Graham has designated the colloidal state, in which it has a very low diffusive power. It was observed by Graham that substances which in solution possessed very low diffusive power were characterized by the absence of the crystallizing property and that they generally formed gelatinous hydrates, while substances of high diffusive power generally belonged to the class of crystalline bodies. Hence the names *colloid* and *crystalloid* applied to these two classes of substances.

But although substances of very low diffusive power are always found to be uncrystallizable, it cannot be inferred that the absence of crystalline property will be necessarily attended with low diffusive power. I proved this experimentally many years ago, and briefly stated the fact in a communication made to this Society on Dialysis in 1862. Yet the opinion appears to be often entertained that the diffusive property of substances in solution bears some relation to the power they possess of assuming a crystalline condition; and as we have now several preparations of iron, largely used and considered to be efficacious medicines, which are entirely devoid of the power of crystallizing, it may be of use to show the position which these and some other preparations occupy with regard to their diffusive properties.

If, as stated by M. Personne in his recent communication to the French Academy of Medicine, a notice of which appeared in the "Pharmaceutical Journal" of last November, dialyzed iron is incapable of being absorbed during its passage through the intestinal canal, and is therefore inactive, and if this is due to the colloidal state of the iron, it might be expected that other preparations of iron would, at any rate to some extent, owe their activity as medicinal agents to their diffusive properties.

Now, among the preparations of iron which have become most largely used in medicine are the scaled preparations, which, in common with dialyzed iron, are often preferred to the crystalline salts of iron on account of the absence of the inky taste which characterizes the latter. The absence of inky taste and strong styptic property may tend to induce a belief that the scaled preparations of iron are either colloidal, like dialyzed iron, or at least that they are deficient in diffusive power, for colloids are usually marked by absence or deficiency of taste.

The experiments, the results of which I am about to lay before the Society, were made for the purpose of showing what the relative diffusive power of some of the salts of iron is, and to what extent this is connected, in such salts, with their crystalline or amorphous condition.

The dialyzer used in the experiments consisted of a glass jar, the membrane-covered mouth of which was $5\frac{1}{2}$ inches in diameter; and this rested in the mouth of a wide earthen dish. Two thousand grain-measures of either a 5 per cent. or a 10 per cent. solution of the salt used was put into the glass jar, and 25 ounces of water into the dish. The diffusate was usually removed at the expiration of two, but sometimes of three days, at the commencement of an experiment, although a longer time was allowed for each separate diffusion when the action became sluggish towards the end of an experiment.

1. *Citrate of Iron, Ferric Citrate.*—Some simple citrate of iron was made in the usual way, by dissolving to saturation moist, recently precipitated hydrated peroxide of iron in solution of citric acid. After being scaled and dried at 212° , it was found to contain 32.29 per cent. of ferric oxide, Fe_2O_3 . Aided by heat, it was perfectly soluble in water, the solution being acid to test paper. 200 grains of this salt dissolved in water to make 2,000 grains (10 per cent. solution) was put into the dialyzer. At the expiration of two days the diffusate was removed, evaporated to dryness, and the residue dried at 212°F . It amounted to 51.26 grains, or 25.63 per cent. of the salt, and on being incinerated it gave 22.45 grains, or 43.75 per cent. of oxide of iron. It thus appeared that the iron was diffusing more rapidly than the acid with which it had been combined. Fresh water having been introduced into the dish, the diffusion subsequently went on more slowly, but the results still showed that the iron was diffusing more rapidly than the acid. At the end of fifteen days, 125.59 grains of the salt had passed through the membrane.

The results of the experiment are given in the following tabulated statement:

200 grains of Citrate, containing 64.58 grains of Fe_2O_3 in Dialyzer.

Days.	Amount of salt diffused.	Amount of Fe_2O_3 in diffusate.	Per cent. of salt diffused.	Per cent of Fe_2O_3 in diffusate.
2	51.26	22.45	25.63	43.75
4	44.81	19.45	22.41	45.63
4	20.50	8.67	10.25	42.26
5	9.02	4.10	4.51	45.45
14	6.37	3.68	3.18	57.77
29	131.96	58.35	65.98	

	Residue in Dialyzer.		Per cent. Fe_2O_3 in residue.
	4.86	2.75	56.65
Total,	136.82	61.10	
Loss,	63.18	3.48	
	200.00	64.58	

It will be seen that of the 200 grains of the salt, containing 64.58 grains of Fe_2O_3 , put into the dialyzer, 131.96 grains of salt, containing 58.35 grains of Fe_2O_3 , had diffused in twenty-nine days, and that there was then a residue in the dialyzer amounting to 4.86 grains of salt, containing 2.75 grains of Fe_2O_3 . There was thus an apparent loss in the process of 63.18 grains of salt, but of only 3.48 grains of Fe_2O_3 , the latter no doubt partly arising from adhesion to the septum. No entire cessation of diffusion was observed.

The citrate of iron used in the experiment was, as it always is, acid to test paper, and the first two diffusates were so also, but the third and subsequent diffusates were neutral, indicating the disappearance of some of the acid radical.

2. *Ammonio-citrate of Iron.*—This salt, as met with in commerce, usually contains about 30 per cent. of peroxide of iron, Fe_2O_3 , but the proportion varies in different samples. Several samples were submitted to dialysis.

(2, a.)—A 10 per cent. solution of ammonio-citrate, containing 30.21 per cent. of Fe_2O_3 , was dialyzed, and the results examined as in the previous experiment. At the expiration of two days, 124.59 grains or 62.29 per cent. of the salt had diffused, and this contained 27.22 per cent. of the Fe_2O_3 . At the end of another four days, 25.79 grains more of the salt, with 32.90 per cent. of Fe_2O_3 , had diffused, making the total diffusate in six days 150.38 grains, or 75.19 per cent. of the salt put into the dialyzer, and 70 per cent. of the iron contained in the salt. The diffusion afterwards went on very slowly, yielding only 3.79 grains in ten days, and at the end of twenty-two days from the commencement, when the diffusion had nearly stopped, the dialyzer contained 20.26 grains of a salt in solution, in which the Fe_2O_3 amounted to 61.61 per cent.

(2, b.)—A 10 per cent. solution of a salt containing 30.9 per cent. of Fe_2O_3 was dialyzed for two days. The diffusate gave 108.94 grains, or 54.47 per cent. of dried salt, containing 27.9 per cent. of Fe_2O_3 . In four days more another diffusate was obtained, giving 37.36 grains,

or 18.68 per cent. of the salt, and containing 34.44 per cent. of Fe_2O_3 . In this case 73.15 per cent. of the salt and 70 per cent. of the iron contained in the salt had diffused in six days. The diffusion then, as in the previous experiment, went on very slowly, and at the end of sixteen days it had nearly stopped, although the dialyzer still contained 19.55 grains of a salt with 52.48 per cent. of Fe_2O_3 in it.

(2, c.)—A 10 per cent. solution of a salt containing 30.65 per cent. of Fe_2O_3 was put into the dialyzer. In two days the diffusate gave 96.11 grains, or 48.05 per cent. of the salt, and this contained 31.42 per cent. of Fe_2O_3 . In four days more another diffusate was obtained, which yielded 27.60 grains, or 13.8 per cent. of the salt, and contained 37.46 per cent. of Fe_2O_3 . In this case 61.85 per cent. of the salt, and 66.15 per cent. of the iron contained in the salt, had diffused in six days. The diffusion had now entirely stopped, although there still remained 32.45 grains of a salt containing 22.55 grains of ferric oxide in the dialyzer.

In the three preceding experiments the solutions used and the diffusates obtained were neutral to test paper. The citrates employed were apparently good commercial samples, well scaled and perfectly soluble, but they evidently differed in constitution, as indicated by difference in the results of their diffusion, for they were all treated similarly and subjected to the same conditions. It will especially be observed that diffusion in the case of (2, c.) ceased entirely at the end of six days, although the dialyzer still contained 32.45 grains of a salt in which there were 22.55 grains of ferric oxide, but this, being in the form of a highly basic salt, was no longer diffusible.

With the view of trying the effect of altered conditions on the salt used in the last experiment, a solution made alkaline with ammonia was used as follows :

(2, d.)—A 10 per cent. solution of the citrate used in experiment (2, c.) was made strongly alkaline with ammonia. In two days the diffusate gave 92.65 grains, or 46.32 per cent. of a salt containing 32.59 per cent. of Fe_2O_3 . Another diffusate was obtained in four days more which yielded 17.55 grains, or 8.77 per cent. of salt containing 51.22 per cent. of Fe_2O_3 . In this case 55.09 per cent. of the salt, and 63.93 per cent. of the iron had diffused in six days. And now, at the end of six days, diffusion had stopped, as in the previous experiment, while the dialyzer still contained an undiffusible salt containing 68.38 per cent. of Fe_2O_3 .

The following table will show the principal results of dialysis in the preceding four experiments :

Ten per cent. Solutions (200 grains of Ammonio-Citrate of Iron in 2,000 grains of Solution) Dialyzed for Six Days.

	Amount of salt diffused.	Per cent. of salt diffused.	Per cent. of Fe_2O_3 in diffusate.	Diffusion on sixth day.	Per cent. of Fe_2O_3 in salt not diffused.
(2, a)	150.38	75.19	28.2	not ended	61.61
(2, b)	146.30	73.15	29.5	not ended	52.48
(2, c)	123.71	61.85	32.7	ended	69.49
(2, d)	110.20	55.10	35.5	ended	63.38

Having observed that diffusion stopped when the salt in the dialyzer became highly basic, and that the diffusate as well as the contents of the dialyzer became more and more basic as the process proceeded, results which I shall have to refer to hereafter, I thought that probably by starting with a salt containing less than the usual proportion of oxide of iron the diffusion might be carried further than it had been found possible to carry it in the preceding experiments.

I obtained a good, well-scaled, neutral and perfectly soluble sample of ammonio-citrate of iron, containing only 25.92 per cent. of Fe_2O_3 . 10 per cent. and 5 per cent. solutions of this salt were submitted to dialysis, in the way already described, and the results obtained are given in the following tabulated statements :

(2, e.)—10 per cent. Solution.

Days.	Amount of salt diffused.	Per cent. of salt diffused.	Per cent. of Fe_2O_3 in dried diffusate.
2	92.23 grs.	46.10	21.56
2	30.62	15.31	32.23
3	23.37	11.68	33.13
3	8.16	4.08	35.50
3	2.27	1.13	37.40
4	.55	.27	39.43

At the end of twenty-eight days, diffusion having stopped, the salt still left in the dialyzer was found to contain 61.26 per cent. of Fe_2O_3 .

(2, e.)—5 per cent. Solution.

Days.	Amount of salt diffused.	Per cent. of salt diffused.	Per cent. of Fe_2O_3 in dried diffusate.
2	66.65 grs.	33.32	25.07
2	25.73	12.86	30.12
3	17.91	8.95	32.44
3	6.4	3.2	35.88
3	2.47	1.23	36.01
4	1.64	.82	38.94
6	1.14	.57	40.01

At the end of twenty-eight days, diffusion having stopped, the salt in the dialyzer was found to contain 68.54 per cent. of Fe_2O_3 .

3. *Potassio-Tartrate of Iron, Tartarated Iron*.—This salt, which, until the adoption of the process now given in our Pharmacopœia, was commonly supplied in the form of an imperfectly soluble powder, is now produced in soluble transparent scales. But, as it is more susceptible of change from slight variation of the conditions to which it is subjected, it is less uniform in composition and properties than the salt previously referred to—the ammonio-citrate. Several samples of potassio tartrate of iron were submitted to dialysis.

(3, a.)—A 10 per cent. solution of potassio-tartrate containing 31.09 per cent. of Fe_2O_3 was put into the dialyzer. In two days 94.02 grains or 47.01 per cent. of the salt had diffused, containing 22.67 per cent. of Fe_2O_3 . In four days more a further quantity of 25.99 grains, or 12.99 per cent. of the whole was obtained, containing 32.97 per cent. of Fe_2O_3 . Only slight diffusion took place beyond this. The residue left in the dialyzer at the end of ten days contained 65.36 per cent. of Fe_2O_3 .

(3, b.)—A 10 per cent. solution of potassio-tartrate, containing 36.25 per cent. of Fe_2O_3 , submitted to dialysis, gave in two days a diffusate from which 53.01 grains, or 26.5 per cent. of a salt containing 8.82 per cent. of Fe_2O_3 was obtained. In four days more another product of 22.32 grains, or 11.16 per cent. of the whole, and containing 7.03 per cent. of Fe_2O_3 was obtained. The residue left in the dialyzer contained 62.70 per cent. of Fe_2O_3 .

(3, c.)—A 10 per cent. solution, the same as the last, but rendered alkaline with potash, after being dialyzed for two days gave a diffusate containing 79.83 grains, or 39.91 per cent. of dry salt, with 12.31 per cent. of Fe_2O_3 . In another four days 33.7 grains or 16.85 per cent. of the salt had diffused, containing 10.71 per cent. of Fe_2O_3 . The residue in the dialyzer contained 60.30 per cent. of Fe_2O_3 .

The following table gives the principal results of the preceding three experiments :

Ten per cent. Solutions (200 grains Potassio-Tartrate of Iron in 2,000 grains of Solution) Dialyzed for Six Days.

	Amount of salt diffused.	Per cent. of salt diffused.	Per cent. of Fe_2O_3 in diffusate.	Diffusion on the sixth day.	Per cent. of Fe_2O_3 in salt not diffused.
(3, a)	120.0	60.0	24.9	not ended	65.36
(3, b)	75.33	37.66	8.2	not ended	62.70
(3, c)	113.53	56.76	11.8	not ended	60.30

It thus appears that the potassio-tartrate of iron is a less diffusable salt than the ammonio-citrate, and this especially applies to the iron as

a constituent of the salts. It also appears, on comparing the results of experiments (3, *a*) and (3, *b*), that the salt containing the larger proportion of oxide of iron diffuses more slowly than the other, and that the diffusate contains a smaller proportion of iron.

4. *Citrate of Iron and Quinia*.—This preparation, for which, in its most approved form, an available process was first published in the present edition of the British Pharmacopœia, although a somewhat indefinite, or at least an undefined, compound, is an important and valuable medicine, and it seemed desirable, in connection with the present object of this inquiry, to determine the extent to which it is capable of undergoing diffusion through a membrane.

A 10 per cent. solution, containing 200 grains of a good sample of citrate of iron and quinia, gave a diffusate in two days yielding 76·8 grains of dry residue, containing 21·65 per cent. of ferric oxide. In two days more it gave a further diffusate, yielding 21·18 grains of dry residue containing 28·8 per cent. of ferric oxide; and again, in two days more it gave 16·6 grains of a residue with 27·7 per cent. of oxide, making the salt diffused in six days equal to 57·29 per cent. of that put into the dialyzer. The proportion of quinia in relation to the iron was not determined in this case, and in this and other respects further experiments have yet to be made; but it is evident from the results obtained that citrate of iron and quinia is a freely diffusible preparation.

5. *Sulphate of Iron, Ferrous Sulphate*, $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$.—A 10 per cent. solution (200 grains in 2,000 grains of solution) slightly acidulated with sulphuric acid and dialyzed for two days gave a diffusate yielding 36·4 grains of ferric oxide, and dialyzed for four days more it gave a further diffusate yielding 14·7 grains of ferric oxide, thus making the amount of iron, reckoned as ferric oxide, diffused in six days, 51·1 grains, corresponding to 35·7 grains of iron, and as the salt put into the dialyzer contained 40·2 grains of iron, it follows that 89·2 per cent. of the iron had diffused in six days.

The experiment was carried on for two days longer, in which time a further diffusate yielding 3·76 grains of ferric oxide was obtained, making the total amount of iron diffused in eight days equal to 96 per cent. of the whole.

6. *Persulphate of Iron, Ferric Sulphate*.—A solution was made by dissolving 200 grains of ferrous sulphate, converting it into the ferric salt, and making it up to 2,000 grains. The solution, therefore, contained

the same amount of iron as that used in the preceding experiment, namely, 40.2 grains Fe. Dialyzed for two days it gave a diffusate yielding 34.9 grains of ferric oxide, and in four days more it gave a further diffusate, yielding 14.2 grains of ferric oxide, thus making the amount of iron as ferric oxide 49.1 grains, corresponding to 34.12 grains of iron, diffused in six days, or 85.3 per cent. of the iron put into the dialyzer.

The experiment was carried on for two days longer, when a further diffusate was obtained, yielding 4.1 grains of ferric oxide, making the total amount of iron diffused in eight days equal to 93 per cent. of the whole.

7. *Chloride of Iron, Ferrous Chloride*, $\text{FeCl}_2 \cdot 4\text{H}_2\text{O}$.—A 10 per cent. solution, 100 grains in 1,000 grains of solution, dialyzed for two days gave a diffusate, yielding 33.96 grains of ferric oxide, and dialyzed for four days more it gave a further diffusate, yielding 4.3 grains of oxide, making 38.26 grains of ferric oxide, corresponding to 26.8 grains of iron, or 95.7 per cent. of the iron contained in the dialyzer, diffused in six days.

8. *Perchloride of Iron, Ferric Chloride*.—100 grains of ferrous chloride converted into a ferric salt, and diluted to 1,000 grains, gave results nearly coinciding with those of the ferrous chloride.

On comparing the results of the foregoing experiments, it will be seen that, while the sulphates and chlorides, and especially the latter, stand pre-eminent in regard to the extent and rapidity with which they undergo liquid diffusion through a membrane, it cannot be said, in a medical sense, that the scaled preparations, and especially those made with citric acid, are deficient in diffusibility, for the latter being given in much larger doses than the former would be absorbed into the system to fully an equal extent.

9. *Dialyzed Iron*.—Although most of the experiments hitherto described in this paper were made simply for the purpose of showing the relative diffusibility of preparations of iron which are used in medicine, without reference to dialyzed iron, and of ascertaining how far the diffusive property of such preparations is affected by their crystalline or amorphous condition, yet as the immediate object of publishing the results at this time was to show that the scaled preparations of iron of the Pharmacopœia are not subject to the objections which have been recently urged against dialyzed iron, I have been led to make some experiments with the view of ascertaining how far the properties ascribed

to dialyzed iron are really possessed by it, and are likely to affect its medicinal efficacy.

Dialyzed iron has been largely introduced to the notice of the medical profession, and strongly recommended as an efficacious chalybeate, which is free from objections that attach to other chalybeate medicines. It would appear to have some strong recommendations if it could be clearly shown that it is capable of being absorbed during its passage through the intestinal canal. But while it is freely admitted that it has the advantage of being nearly tasteless, free from astringency, and not liable to cause constipation or gastric disturbance, it has at the same time been broadly asserted that it is perfectly inert on account of its colloidal nature—that the oxide of iron is precipitated in the stomach in a state in which it is insoluble in the acids of the stomach and incapable of undergoing liquid diffusion.

The following experiments were made with a sample of dialyzed iron containing 5.28 per cent. of ferric oxide and .23 per cent. of chlorine. The iron was completely precipitated by adding to the dialyzed iron twenty times its volume of water of the London water supply.

(9, *a.*)—The oxide of iron obtained from 100 grains of the dialyzed iron by addition of 2,000 grains of New River water was collected on a filter, washed with distilled water and digested with water to which hydrochloric acid of known strength was gradually added until the oxide of iron became apparently dissolved, a clear and permanent, although not brilliant, reddish-brown liquid resulting. It was found that 1.44 grains of hydrochloric acid (HCl) was thus required for the 5.28 grains of oxide of iron. This solution was put into a dialyzer, but at the end of two days not a trace of iron had passed through the septum.

(9, *b.*)—Another similar quantity of precipitated oxide was digested with double the quantity of hydrochloric acid, namely 2.88 grains of HCl, but the result at the end of two days was the same. None of the iron had diffused.

9, *c.*)—Another similar quantity of oxide, namely, 5.28 grains, was digested with 7.5 grains of hydrochloric acid (HCl), this being the quantity required for converting the ferric oxide into ferric chloride, in the event of such conversion occurring. In this case it was found that after the liquid had been in the dialyzer for two days a very small quantity, .1 grain, of the iron had diffused.

In the last three experiments the oxide had been digested at a tem-

perature of 100°F. , for about an hour, before putting the liquid into the dialyzer.

(9, *d.*)—In this experiment the oxide of iron and hydrochloric acid, in the proportion for forming ferric chloride, were boiled together for several minutes, and the liquid after cooling was put into the dialyzer. At the end of two days a trace of iron had passed through the septum, but not more than in the preceding experiment.

The hydrochloric acid in these experiments was greatly in excess of that usually present in the free state in the stomach, which, according to Lehmann, is about .125 per cent.

A suggestion having been made that the colloidal iron of dialyzed iron, although not diffusible when brought into a state of apparent solution with hydrochloric acid, even when this is much in excess of what is required for such solution, might be taken up by the albuminoids in the stomach and thus rendered assimilable, experiments were made in that direction.

(9, *e.*)—A dilute solution of albumen with hydrochloric acid was digested for two hours with dialyzed iron at 100°F. , and then left in a dialyzer for two days, but no iron was found in the diffusate.

(9, *f.*)—A peptone was prepared by dissolving 50 grains of coagulated albumen with 2 grains of pepsin in 500 grains of 1 per cent. dilute hydrochloric acid, adding 50 grains of dialyzed iron, and digesting them together for two hours at 100°F. This was put into a dialyzer for two days, but here again not a trace of iron was found in the diffusate.

In view of these results it can hardly be conceived that dialyzed iron should be an active or efficacious medicine. At any rate it remains for those who advocate its use to suggest a theory by which medicinal activity may be reasonably ascribed to a substance having the properties which this preparation has been proved to possess.—*Pharm. Jour. and Trans.* [London], March 6, 1880.

VARIETIES.

Bromhydrate of Morphia.—This is more soluble in water and is twice as powerful as the sulphate. It combines the sedative effects of the bromine with the anodyne properties of the morphia. It is not so dangerous, and it is not so apt to be followed by unpleasant symptoms. It is the drug especially for irritative affections of the spinal cord.—*Journal de Therapeutique*, from *Western Lancet*, Jan., 1880.

Sodium Salicylate in Phthisis. By A. Hutchins, M.D.—I desire to call attention to certain useful results to be obtained from sodium salicylate in the advanced stage of phthisis. I am indebted to Dr. B. A. Segur for the original suggestion. The cases in which its effects have been observed are too few, and the effects not sufficiently constant to justify any positive statements as to the precise indications for its use; yet, so far as have been observed, the effects are pronounced enough to justify further observation. My studies, thus far, have been limited to cases in the Brooklyn City Hospital, while Dr. Segur, in addition to some experience in St. Peter's Hospital, has had some cases in private practice, where its effects have been observed.

Allowing this paucity of experience to stand for marginal notes for future observers, it may be stated that the sodium salicylate acts promptly and pleasantly in modifying the colliquative diarrhœa of phthisis. Its action is accompanied by no such contingent or secondary effects as belong to the use of opiates. Of course, no cure of the diarrhœa is expected, and a recurrence of the symptom can be met by resuming the medicine. In connection with this, it has been noticed that the administration of the sodium salicylate has been followed by a marked amelioration of the cough, a subsidence of the hectic, and a diminution, sometimes suppression of the night-sweating. It is not known how far these effects can be prolonged by the continued use of the drug, nor to what extent it may be beneficial to intermit it with other remedies. The most that can be said with positiveness is, that without disturbance to the digestion, it, at times, serves an excellent purpose in modifying, to the great relief of the patient, some of the more prominent and distressing symptoms that belong to the latest stage of phthisis. This fact is the only justification for intruding the results of such a limited observation. Ten grains of the drug, repeated every three or four hours, have been found adequate. Dissolved in water, it will not be found offensive if taken in iced-water.—*Proceedings of the Med. Soc. of the county of Kings, New York*, Feb., 1880.

A New Anthelmintic.—The *Ocymum basilicum*, a plant known in Buenos Ayres under the name "albochaca," has an action of such a nature that the worms in every stage of development rapidly leave their location after the juice reaches them. Its use is so much the more to be recommended since, in the event no worms are present no injurious effect results from the plant, but a laxative and disinfectant action is the only result. Fifty grams of the juice is given, followed in two hours by a dose of castor oil. A free discharge of the worms may be expected.

The above observations of Dr. Lemos and the results obtained are very encouraging, and invite further investigation, the more since the number of anthelmintics is limited, and their action often unsatisfactory.—*Med. Neuigk.*, No. 34, 1879, from *Gaillard's Med. Journ.*, March, 1880.

Salicylate of Sodium in Gout.—M. Bouloumié has communicated to the Medical Society of Paris the results of his investigations upon the action of salicylate of sodium during an attack of gout. The author has administered the salicylate to some of his own patients, and he has inquired of a large number who came to Vittel for treatment, whether or not they had been subjected to this method. His own

patients had only been slightly benefitted by the drug, and of thirty-nine patients, whose cases he directed at the mineral springs, only six had taken salicylate of sodium, though they did not appear to be much relieved thereby. Whilst he recognizes, therefore, that salicylate of sodium acts by assuaging the pain, M. Bouloumié would restrict its administration in chronic gout. He points out the inconveniences and even the dangers which may arise from its use, especially if the heart or kidneys be affected, whilst the results are but slight except in very favorable or in subacute cases. He believes that the drug is an active remedy, which should be kept in the therapeutic arsenal to combat gout, though its action in this disease is not so marked as in rheumatism.—*Le Progrès Médical*, from *Cincinnati Lancet and Clinic*, March 13, 1880.

Sclerotic Acid.—This acid is probably the active principle of ergot, having a feeble acid affinity, uniting with sodium to form a stable sclerotate. The acid and its sodium salt have the therapeutic effects of ergot, but the salt in a less marked degree. Both chiefly act on the central nervous system. In mammals the heart is not influenced by even relatively large doses. At death the respiration ceases before the heart. In mammals the acid accelerates intestinal peristalsis; and it excites contraction both of the pregnant and non-pregnant uterus, pre-existing contractions being intensified so that the organ assumes a paler tint. Nikitin, who has been recently studying its effects, says that he calculates that a man weighing about 110 pounds would be killed by about 150 grains of sclerotic acid. The ordinary hypodermic dose is 0.02 to 0.03 gram (one-third to one-half grain) three times a day. Sclerotic acid seems likely before long to partially replace ergot as a drug. It has the advantage of remaining indefinitely without loss of strength, if only kept in a dry place and undissolved. Its sodium salt is considered the best form for internal use in the human subject. Hypodermic injection causes a temporary sharp pain. Von Ziemssen claims for sclerotic acid over ergot in that the former causes no inflammation at the seat of puncture.—*N. C. Med. Jour.*—*Gaillard's Med. Jour.*, April, 1880.

MINUTES OF THE COLLEGE.

PHILADELPHIA, March 29th, 1880.

The annual meeting of the Philadelphia College of Pharmacy was held this day at the Hall of the College. The President, Dillwyn Parrish, presided, and twenty-six members signed the register.

The minutes of the last stated meeting were read, and, on motion, adopted.

The minutes of the Board of Trustees since the last meeting of the College were read by Thos. S. Wiegand, in the absence of the Secretary of the Board, and, on motion, adopted.

These minutes make mention of the death of Charles H. Dingee, which occurred in December last. He was one of the first graduates of the College. A short sketch of his life will be found in an obituary notice in the February number of the JOURNAL of this year.

Thomas S. Wiegand, Librarian, read the following report of the year's operations. It was, on motion, accepted, and directed to be placed on the minutes.

PHILADELPHIA, March 29th, 1880.

The Librarian respectfully reports that the theses for the last year have been arranged and catalogued for binding; that there has been added to the Library of exchanges 22 volumes, by donation 30 volumes, by purchase 35 volumes. Of these last, the 10 volumes of the "Encyclopedia Britannica," purchased by funds left to the College for that purpose by our late fellow member, Algernon S. Roberts, form a most valuable addition to it. All of which is respectfully submitted.

T. S. WIEGAND, *Librarian*.

The Curator's report was read by Joseph P. Remington, and was, on motion, accepted.

The Curator would respectfully report that the additions to the Cabinet for the last year were not so numerous as in the preceding year. There were, however, three valuable cases of Indian drugs from Dr. Dymock, of Bombay, and a valuable collection from California received, specimens from which have been exhibited at some of the pharmaceutical meetings. These meetings, as in previous years, have been the means of contributing various specimens to the Cabinet.

JOSEPH P. REMINGTON, *Curator*.

Henry N. Rittenhouse, Chairman of the Committee on Publication, presented an account of the Treasurer of that committee, and also read the following report, which was, on motion, adopted. The statement of account accompanying this report exhibits a very satisfactory condition of affairs, and it is the general opinion of members that this committee are rendering a valuable service to the College.

PHILADELPHIA, March 29th, 1880.

To the Officers and Trustees of the Philadelphia College of Pharmacy:

GENTLEMEN.—The Committee of Publication respectfully report that the JOURNAL of the College has been regularly and promptly issued during the year just closed. The reports of the Editor and Business Editor, which accompany this, will give full details of the management.

Respectfully,

HENRY N. RITTENHOUSE,
Chairman of Committee.

Professor Maisch, Editor of the JOURNAL, read the following interesting report of his labors during the past year. And as that valuable publication derives much of its interest from the contributions of members of the College and others interested in chemical and pharmaceutical science, it is to be hoped that the suggestions made by him will be followed up by everyone who may be able to contribute matter of a practical or scientific character. The report was, on motion, adopted, and ordered to be published in the minutes.

In presenting his annual report, the Editor is pleased to state that for the year ending with the present month a larger number of original papers were published in the JOURNAL than through the preceding year, though not quite as many as in some former years. During the past twelve months the total number of original papers was 84, or, on an average, 7 for each month, exclusive of original translations, abstracts, gleanings, editorials and other notices. Of the number stated, there were 35 papers on subjects relating to materia medica, 12 to chemistry, 30 to pharmacy, and 7 papers on other subjects of general interest. The papers were contributed by 60 authors, of whom three furnished 5 papers each, two 3 papers, eight 2 papers, and forty-seven 1 paper each. In this number are included abstracts from 19 theses, which is a gratifying increase over most of the preceding years.

The active members of the College who show a direct interest in the JOURNAL by contributing to it the results of their observations and experiments has remained the same (16) for some years past, except for the year ending March, 1879, when they were 13, with 22 papers. The number of papers contributed by them was 27 in March, 1876; 35 in 1877, 41 in 1878, and 25 in March, 1880. In addition to these, the Editor takes pleasure in acknowledging the kind offices of Professor Sadtler and of Mr. L. von Cotzhausen, who, for more than a year past, have furnished the JOURNAL regularly with abstracts from numerous chemical and pharmaceutical papers which could not be published in full. Under the direction of the Publishing Committee, the Editor has made further arrangements for the regular contribu-

tion to the JOURNAL of formulas and observations on new pharmaceutical preparations and improvements in processes and manipulations, as well as also for the contribution of new observations on the action, doses and therapeutical application of drugs, as far as they are of special interest to the pharmacist. While it is hoped that the usefulness of the JOURNAL will thereby be still further increased, the Editor ventures to urge upon the members, as he has done on former occasions, to communicate to him practical notes and observations made in the laboratory or at the prescription counter, so that they may be published for the benefit of the profession.

It is but proper that the Editor should again speak a good word in favor of the Pharmaceutical Meetings, at which practical and scientific topics are very properly brought forward. While these meetings are held under the supervision of the College, its members are expected to be especially interested in them; but all readers of the JOURNAL may, if they so desire, bring their investigations in this manner to general notice by addressing, in due time, either the registrar of these meetings or the editor of the JOURNAL. During the past year 21 papers have been read at the Pharmaceutical Meetings, and of this number several interesting essays have been furnished by non-members and by students of the College.

The Editor embraces this occasion to thank the various contributors and correspondents, and to express the hope in the continuance of their interest in the JOURNAL.

Respectfully submitted,

JOHN M. MAISCH, *Editor*.

Thomas S. Wiegand, Chairman of the Committee on the Sinking Fund, reported that he had paid over to the Treasurer of the College the balance remaining in his hands. The report was, on motion, accepted.

The death of Samuel T. Jones, a member of the College, at the age of 38 years, from disease of the heart, was announced by Thomas S. Wiegand, who paid a tribute to his integrity and worth.

Professor Maisch announced the death of the following honorary members of the College:

Professor Carl Frederick Mohr, Ph.D., M.D., of the University of Bonn, which occurred September 28, 1879;

Professor J. B. Alphonse Chevallier, Honorary Professor of the Superior School of Pharmacy of Paris, on the 30th of November, 1879;

Professor H. A. L. Wiggers, Ph.D., Professor of Pharmacy at the University of Göttingen, on the 23d of January, 1880, obituary notices of all of whom have been published in the "Journal of Pharmacy."

A communication from the American Academy of Arts and Sciences of Boston, relative to the celebration of its one hundredth anniversary on the 26th of May, 1880, was read, conveying an invitation to this College to send one or more delegates to attend the celebration and reception, with a request that an answer be sent to the Secretary of the Committee. On motion of Charles Bullock, Professor Robert Bridges and Professor Samuel P. Sadtler were appointed delegates to attend the celebration.

The Treasurer reported a number of members as being five years in arrears to the College. A motion was made and adopted, that in accordance with the custom heretofore pursued, their names be stricken from the roll of members.

This being the time for the annual election, the Chair appointed Edward C. Jones and William B. Thompson tellers, who, after counting the ballots, announced the election of the following officers, trustees and standing committees, viz.:

President—Dillwyn Parrish.

First Vice President—Charles Bullock.

Second Vice President—Robert Shoemaker.

Treasurer—Samuel S. Bunting.

Recording Secretary—William J. Jenks.

Corresponding Secretary—Alfred B. Taylor.

Board of Trustees—for three years—John M. Maisch, Robert England, Samuel P. Sadtler.

Publication Committee—John M. Maisch, Henry N. Rittenhouse, Thomas S. Wiegand, James T. Shinn, Charles Bullock.

Sinking Fund Committee—Thomas S. Wiegand, T. Morris Perot, James T. Shinn.

Editor—John M. Maisch.

Librarian—Thomas S. Wiegand.

Curator—Joseph P. Remington.

There being no further business, on motion, adjourned.

WILLIAM J. JENKS, *Secretary*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, April 20th, 1880.

The meeting was called to order by asking Mr. W. B. Thompson to preside; the minutes of the last meeting having been read, were, on motion, approved.

Donations to the cabinet and library being the first business in order, Prof. Maisch presented a copy of the Proceedings of the American Pharmaceutical Association for 1879. Dr. Chas. L. Mitchell presented a specimen of what is sometimes known in commerce as gum-hogg, it being used by paper stainers in making what is called marble paper. The thanks of the meeting were tendered to the donors for them.

Dr. Mitchell read a paper upon the *gum-hogg* (see page 250). This elicited some remarks descriptive of various kinds of gum, and particularly tragacanth of low grades with which, in Prof. Maisch's opinion, this so-called gum-hogg is identical.

The Registrar read a short note on *spiritus ammoniæ aromaticus*, from W. S. Plumer, Jr., Ph.G., as follows:

"In preparing *spiritus ammoniæ aromaticus* there is frequently a heavy precipitate; some of the text books state that it is due to the insolubility of carbamate of ammonium, generally found in commercial carbonate, in the alcohol. My plan in making this preparation is to dissolve the carbonate of ammonium in the water or ammonia and water, and allow it to stand for at least a week in a closely stoppered bottle; then having made a solution of the oils in the alcohol, add the ammonia solution to the solution of the oils quickly; if this is done there will be no precipitate whatever."

A paper upon *ethyl bromide* was read by Dr. L. Wolff, and is published upon page 241. The fatal case in which the ethyl bromide had been employed, mentioned in Dr. Wolff's paper, was discussed, after which Prof. Remington read a paper upon the same subject (see page 248). The papers read were referred to the publication committee, and the thanks of the meeting were tendered to the gentlemen for their very interesting communications.

Prof. Remington exhibited a little card giving the three metrical units employed by pharmacists, viz.: those of length, capacity, and weight. The card is a square, having for its side one decimeter, or one-tenth the unit of measure of length, the meter; a cube of the decimeter gives the unit of capacity, or liter; a cube with sides measuring one-tenth of a decimeter being a cubic centimeter, filled with distilled water, gives the unit of weight one gram; the card itself weigh nearly five grams; upon the reverse of the card is a device to assist those not familiar with the divisions and increments of the system to remember them.

A member present asked if any of the members had any experience in preparing *kumys*, to which there were two or three responses, but no exact formula was given.

There being no further business, the meeting adjourned.

THOS. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Pharmacy at Saratoga Springs.—The American Pharmaceutical Association having selected Saratoga Springs, N. Y., as the place for holding the next annual meeting, the pharmacists of that celebrated watering place have already commenced making preparations with the view of making the meeting as profitable and enjoyable to the visiting members as possible. A meeting was held April 23d at the Arlington House, at which the Local Secretary, Mr. Chas. F. Fish, presided, Mr. E. L. Fish acting as secretary. The following committees were appointed:

Committee on Finance—Messrs. Chas. F. Fish, J. M. Colcord, F. H. Hathorn, Wells and Henry Lawrence.

Excursions and Entertainment—Messrs. Wells, Schuyler, Johnson and Lancashire.

Railroad and Transportation—Messrs. George H. Fish, Thurber, Waring and Menges.

Printing—Messrs. Pennington, Moody, Settle and Deal.

Exhibition—Messrs. J. M. Colcord, Schermerhorn, Chas. F. Fish, Wells, Henry Lawrence, Moriarta, Derrick and Mingay.

Hotels—Messrs. Mingay, Cranmer, Collins, Wells, Moody and Baldwin.

Express—Messrs. Henry Smith, Barnes and E. L. Fish.

Executive Committee—Messrs. Chas. F. Fish, J. M. Colcord, Mingay, Schermerhorn, Wells, Cranmer, and a representative of each spring company.

A large and well-appointed hall has already been secured in which to hold the meeting, and in the immediate neighborhood a large and well-lighted building has been selected for the exhibition of articles of pharmaceutical interest. The meeting promises to be attended by many members with their families, and exhibits have already been promised by several prominent firms.

The local secretary has thus far secured free transportation for the goods intended for exhibition in Saratoga by the Hudson River Steamboat Lines and by the Delaware and Hudson Canal Company's railroad. An abatement in freight rates has been obtained from several railroads, and negotiations with other roads are in progress. The principal manufacturing cities and ports of importation will thus secure desirable facilities; and since it is expected that the express companies will grant similar liberal terms for forwarding smaller packages intended for exhibition, it is hoped that this feature connected with the annual meetings of the Association will be as varied and interesting as heretofore.

Saratoga being accessible during the summer and autumn from all parts of the United States and Canada by a variety of routes at low excursion rates, there will be no difficulty in arranging excursions from all principal cities; and, in addition thereto, the local secretary is endeavoring to obtain favorable terms from the various railroads and steamboat lines leading towards Saratoga. We understand that several short excursions, at a moderate cost, are contemplated after the meeting

shall have adjourned, among them one to Au Sable Chasm, including a sail on the beautiful Lake Champlain, and, on the return trip, a visit to several interesting points on Lake George.

Philadelphia College of Pharmacy.—The usual summer excursions in botany commenced April 14th, and are for the present year in charge of Mr. John Cook. As heretofore, they take place on the afternoon of every Wednesday.

Massachusetts College of Pharmacy.—The twelfth commencement was held at Union Hall on Thursday evening, April 15th, when the President, B. F. Stacey, conferred the degree of Graduate in Pharmacy upon the following gentlemen :

John Walter Bachelder (*Gelsemia and Gelsemic Acid*), James Sylvester Barry (*Salicylate of Sodium*), George Richard Bell (*Iodoform*), Charles Andrew Boyden (*Erythroxylon Coca*), Franklin Edward Boyden (*An Ideal Pharmacy*), Joseph Allen Chapin (*Boracic Acid*), George Sumner Churchill (*Subnitrate of Bismuth*), Frank Clough (*Oleoresin of Capsicum*), Charles Louis Curtis (*Eremocarpus Setigerus*), Willard Henry Cutting (*Acer Saccharinum*), Azro Milton Dows (*Rhamnus Frangula*), Eugene Hamblet (*Benzoic Acid and its Official Source*), Frederic Albert Jewett (*Chlorate of Potassium*), James M. Kerrigan (*Oxide of Zinc*), Elie Henry La Pierre (*Tartaric Acid*), Charles James Peters (*Potassic Iodide*), Alfred Pillsbury, Jr. (*Soap Tree Bark*), George Henry Sanderson (*Cannabis Indica*), William Edward Turple (*Nitrite of Amyl*).

A certificate of proficiency was awarded to Ida Rebecca Brigham, M. D. (*Anacardium occidentale*). Prizes consisting of books were presented in the department of pharmacy, for best term recitations, to F. A. Jewett (senior class) and Chas. M. Frye (junior class); and for best final examination, to G. H. Anderson (senior class) and H. F. Totman (junior class).

New York College of Pharmacy.—The lectures on Botany by Prof. Alphonso Wood will commence May 5th, and excursions to the fields and forests in the vicinity will occasionally be undertaken.

National College of Pharmacy at Washington, D. C.—The annual meeting of the College was held April 5th. The reports from officers and committees made a very favorable showing of the affairs of the College. The graduation of students will not take place until after the close of the spring course in analytical chemistry.

The following officers were elected for the ensuing year: President, Mr. J. D. O'Donnell; Vice-Presidents—Mr. G. G. C. Simms, Mr. R. A. Bacon; Secretary, Mr. Charles Becker; Treasurer, Mr. John A. Milburn; additional Trustees—Messrs. W. S. Thompson, R. B. Ferguson, H. E. Kalusowski, W. G. Duckett, J. D. Franzoni, Karl Kulberg and Wash. C. Milburn.

Alumni Association Louisville College of Pharmacy.—At the annual meeting held March 23d the following officers were elected: President, J. A. Flexner; Vice-Presidents—Emil Scheffer, Jr., J. C. Loomis; Recording Secretary, Otto E. Mueller; Corresponding Secretary, Albert J. Schoettlin; Treasurer, B. Buckle; Executive

Board.—John F. Rudell, O. A. Beckman, Wm. Tafel, George Stauber, Henry Buschemeyer, Jr.

Pharmaceutical Society of Great Britain.—At the Pharmaceutical meeting held March 3d, Mr. G. F. Schacht in the chair, Prof. Redwood read a very interesting paper on *the diffusive properties of some preparations of iron* (see p. 265). In the discussion following, for which we cannot make room, Prof. Attfield said that he adhered to Graham's views and regarded it not improbable that the scaly preparations of iron would be found to be crystalline. Mr. Martindale referred to the activity of basic oxychloride of iron, prepared by dissolving pasty oxide of iron in perchloride solution, and regarded the inefficiency of dialyzed iron as "not proven."

Dr. Symes stated that his experiments were performed in a different manner from those made by Prof. Redwood, namely, by digesting at 100°C. a mixture of dialyzed iron and peptone, in a dialyzer, when iron was found to diffuse through.

After some further discussion, in which it was stated that commercial ammonio-citrate of iron usually contained more than the minimum quantity (27 per cent.) of oxide allowed by the British Pharmacopœia, the meeting adjourned.

EDITORIAL DEPARTMENT.

Tests for Arsenic.—The following note in reference to the statements made on page 194 of our last number explains itself. We are not prepared to adopt the conclusion arrived at by our correspondent.

To the Editor of the American Journal of Pharmacy:

In an editorial note on my article in the April number relative to tests for arsenic, regret is expressed that I do not give the alleged authority for the solubility of antimony in hypochlorite of sodium. Not being able to recall the authority in question I wrote to Mr. James, the attorney who conducted the cross-examination, and will quote from his letter in reply:

"The book I read from on that subject (the solubility of antimony in hypochlorite of sodium) was 'Wharton and Stillé's Medical Jurisprudence,' vol. 2, paragraph 429, where it is stated that hypochlorite of sodium dissolves the arsenical spot, but that antimonial spots resist its effect, *unless they are small and of a dull appearance, when they will be dissolved.*"

This certainly brings the subject down to a fine point, and the cautious analyst will have to be sure that the arsenical spots are not "small and of a dull appearance," which in all cases is not possible. Hence, we believe that the hypochlorite of sodium is an unreliable test for the spots on porcelain.

PHIL. HOGLAN.

Newcomerstown, O., April 20, 1880.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Proceedings of the American Pharmaceutical Association at the Twenty-seventh Annual Meeting, held in Indianapolis, Ind., September, 1879. Philadelphia: Sherman & Co., printers, 1880. 8vo, pp. 910. Price, bound in cloth, \$7.50.

Having in the October number given a condensed account of the transactions of the last meeting of the American Pharmaceutical Association, it remains now

merely to call attention to this publication, in which, as usual, the very full and carefully arranged report on the progress of pharmacy is a prominent feature, occupying more than one-half (524 pages) of the book. Of great interest is also the report on the drug market, which is supplemented by a comprehensive report on the drug market of San Francisco and the resources of California, from the pen of Mr. Jas. G. Steele, covering nearly 100 closely printed pages. The papers read at the meeting were not quite as numerous as on some former occasions, but they will be found of great interest and even importance. On reading the graphic descriptions in Mr. Wellcome's paper, "A Visit to the Cinchona Forests of South America," it will be a source of regret that his other essay, relating to the practice of medicine and pharmacy in Peru, was lost and could not be prepared again for this volume.

The frontispiece is a well-executed artotype of the late Eugene L. Massot, of St. Louis, a merited tribute to the memory of a worthy follower of pharmacy.

It is to be regretted that the short-hand report of the discussions is uncommonly meagre, as compared with previous years. In all other respects we believe the volume compares favorably with the preceding ones, and is more handy than others of a similar size, in consequence of the selection of a paper more suitable for voluminous books. The volume may be obtained from the Permanent Secretary.

The Microscope and Microscopical Technology. By Heinrich Frey, Professor of Medicine in the University of Zurich. Translated and edited by Geo. R. Cutter, M.D., etc. Second edition. New York: William Wood & Co., 1880. 8vo, pp. 660.

The original work in German is well known and highly valued by microscopists conversant with the German language. The labor of translation of such a work is not an easy one; but it has been well done by the editor.

The description of the microscope, with its various accessories, is very instructive, and the means for using the instrument, for preparing microscopic objects, for mounting them, etc., are fully described. The information gained in this direction by a careful perusal of the work is considerable; and the practical hints given on almost every page of the work are such as will be duly appreciated by not only the novice, but even by those who are familiar with the use of the microscope.

The work treats chiefly of the tissues, secretions and excretions of animals, and is therefore primarily intended for the use of the physician and the student of anatomy and physiology; but its practical scope is by far wider, and the student of general as well as special biology will find it a most welcome addition to his works of instruction and reference in a branch of investigation by means of an instrument which "has conquered a new world of minuteness for natural science."

Paper, illustrations and the typographical outfit in general are very commendable.

A Practical Handbook of Medical Chemistry applied to Clinical Research and the Detection of Poisons. By Wm. H. Greene, M.D., Demonstrator of Chemistry in the Medical Department of the University of Pennsylvania, etc. Philadelphia: Henry C. Lea's Son & Co., 1880. 12mo, pp. 310. Price \$1.75.

Good works on medical chemistry are by no means numerous. Notwithstanding

the many patient investigations undertaken by competent men, the various transformations of organic compounds in the living body are mostly involved in obscurity, so that biological chemistry can scarcely as yet be ranked with the exact sciences. It is for this reason the more important that what has been accomplished should be presented to the student, not as isolated facts, but in groups as natural as the nature of the numerous principles will admit. The little work before us is one which we think will be studied with pleasure and profit.

After a brief chapter on manipulations, the organic proximate principles taking part in the animal economy are described, commencing with the fatty and other acids, which are followed by the sugars, the principles found in urine, flesh and bile, the albuminoid and allied bodies, and the animal pigments. Of each principle there is usually given its origin, mode of preparation, properties and tests, and in case two or more resemble each other, the differences are pointed out. The descriptions, though brief, are clear, and in most cases sufficient for the purpose; frequently, also, further elucidated by acceptable wood-cuts, illustrating the shape of crystals, apparatus, etc. Where brevity is an object, certain portions may always be picked out by the critical that would seem to deserve more detailed consideration. In this respect, the book will, in nearly all cases, meet general approval. Among the few instances noticed by us, where some additional facts appear to be deserving of greater detail, are the action of the various ferments in the presence of acids and alkalis.

Part II treats of the analysis of secretions, excretions, etc. The author's familiarity with his subject is everywhere evident in the selection of the processes for separation, identification and estimation. The same is also observed in Part III, which treats of the detection of poisons, and is, as the author tells us in the preface, modeled on the plan of Bowman's chemistry.

We regard the work not only very well adapted to the wants of the medical student, but we are convinced that the physician and the pharmacist will find it very useful in giving reliable advice in the examination of urine, calculi, blood, milk and other animal matters, and in the detection and identification of poisons. In usefulness, as well as in appearance, the work will be a desirable addition to the medical and pharmaceutical library.

A Guide to the Practical Examination of Urine, for the use of Physicians and Students. By James Tyson, M.D., Professor of General Pathology and Morbid Anatomy in the University of Pennsylvania, etc. Third edition. Philadelphia: Lindsay & Blakiston. 1880. 12mo, pp. 183. Price, \$1.50.

It is little more than a year ago since we reviewed the second edition of this work, and it gives us pleasure to state that the present revised one deserves all the praise accorded to the preceding.

The Art of Perfumery, and the Methods of Obtaining the Odors of Plants, etc. By G. W. Septimus Piesse, Ph.D., F.C.S., etc. Fourth edition. Philadelphia: Presley Blakiston. 1880. 8vo, pp. 506.

Piesse's "Perfumery" is too well known, and has been for such a long time in the

hands of those interested, that scarcely more seems to be necessary than to mention the fact that a new and improved edition has made its appearance. It treats of the growth and general flower-farm system of raising fragrant herbs; of the method of obtaining the odors; of the manufacture of perfumes for the handkerchief; scented powders, odorous vinegars and salts; snuff, dentifrices, cosmetics, perfumed soaps, etc., and gives some formulas for preparing artificial fruit essences. The work has been much improved by the addition of all recent observations of importance bearing on the subject, and contains a large number of good illustrations of articles and apparatus used in the preparation of perfumery. The new edition will doubtless be used with the same profit and instruction that was obtained from the older ones.

Headaches; their Nature, Causes and Treatment. By William H. Day, M.D., etc. Third edition, with illustrations. Philadelphia: Lindsay & Blakiston. 1880. 12mo, pp. 322. Price, \$2.00.

In a little over two years two editions of this little work have been exhausted, which proves that this monograph has been well received by the profession. The new edition is essentially the old one, with the addition of several pages of new matter. It will doubtless be found as convenient for use and instructive in practice as the two preceding editions.

Sea-air and Sea-bathing. By John H. Packard, M.D., Surgeon to the Episcopal Hospital. Philadelphia: Presley Blakiston. 1880. 16mo, pp. 124. Price, 50 cts.

As one of the series of American Health Primers this little volume is deservedly in good company, and since the subject discussed by it is one in which nearly everybody is interested, it will be welcomed by many as a guide or for suggestions while visiting the seashore, either in summer or winter.

Ein Beitrag zur Biologie einiger Schizomyceten. Von H. v. Boehlendorff. Dorpat, 1880. 8vo, p. 51.

A Contribution to the Biology of Several Schizomycetes.

This inaugural dissertation describes the development of bacteria under very varying conditions.

Ueber die Wirkung der Antiseptica auf ungeformte Fermente. Von Iwan Wernitz. Dorpat, 1880. 8vo, p. 93.

On the Effect of Antiseptics upon Formless Ferments.

The investigations relate to the so-called chemical ferments, such as emulsin, myrosin, diastase, ptyalin, pancreatin, pepsin, etc.

Untersuchungen über die Wurzelfasern von Rhinacanthus communis. Von Dr. P. Liborius. Dorpat, 1880. Pp. 12.

Investigations on the Rootlets of *Rhinacanthus communis*, Nees.

This plant belongs to the Nat. Ord. Acanthaceæ, is indigenous to Japan and

China, and is known in India as *guikarnee*. The rootlets, which are sold in Hong-kong at \$2 per pound, are used in preparing a bright red tincture with 5 parts of strong alcohol. The tincture known in the East as *ringworm tincture* is regarded as an effectual remedy against ringworm and other cutaneous diseases. The author isolated from the drug 1.87 per cent. of a dark red resin-like principle, *rhinacanthin*, which is not a glucoside, is soluble in alcohol and ether, and dissolves in petroleum benzin and chloroform with a yellow color. It is present in the milk juice of the bark, and represents the antiparasitic action of the drug.

Quantitativ-chemische Untersuchungen über die Zusammensetzung der Kork-, Bast-, Sclerenchym- und Markgewebe. Von Joh. Koroll. Dorpat, 1880. 8vo, pp. 52.

Quantitative Chemical Examinations on the Composition of the Tissues of Cork, Liber, Sclerenchyma and Pith.

The substances examined are shells of hazel nuts and walnuts, liber of the linden and elm, root of chicory and turnip, pith of elder and leathery cork of birch.

A Catalogue of the Forest Trees of North America. By Chas. S. Sargent, Arnold Professor of Agriculture in Harvard College. Washington: 1880. 8vo, pp. 93.

This is one of the publications issued in reference to the pending tenth census of the United States, of which this catalogue will form a part. Its preliminary publication was made with the view of obtaining reliable information from all parts of the country in regard to geographical distribution, region, elevation, soil, dimensions, local names, economic uses, products, etc., of each species. It is to be hoped that botanists, pharmacists and others interested in this matter will aid the special agent of the tenth census, Prof. Sargent, so as to make the report as complete as possible.

Adulteration of Food. By Albert R. Leeds, Ph.D., Professor of Chemistry in the Stevens Institute of Technology.

A reprint from the third report of the New Jersey State Board of Health, giving the results of numerous analyses, and advocating suitable legislation, with the view of restraining the evil within as narrow limits as possible.

Chemische Beiträge zur Pomologie. Von Theodor Pfeil. Dorpat, 1880. Pp. 46.

Chemical Contributions to Pomology.

A very interesting and instructive examination into the proximate constituents of the apple during the period of development and ripening. The weight of the fruit increased from 1.80 gram (June 8th) to 89.10 grams (Aug. 15th), during which period the weight of sugar increased from 0.037 to 4.366 grams, free (malic) acid from 0.031 to 0.673 gram, starch from 0 to 0.201 gram, etc.

Premières études sur l'Erythroxylon Coca. Par Victor Truphème. Montpellier, 1879. 8vo, pp. 53.

A very creditable monography on coca, giving the botanical history, its production, commerce, general characters, chemistry, physiological action, pharmaceutical preparations and literature.

Du Thapsia Garganica on Bounéfa des Arabes. Par Charles Blanchet. Montpellier, 1880. 8vo, pp. 73.

This essay contains the history of the species named, its uses and chemistry. The author has also investigated a false thapsia, which is the root of *Ferula nodiflora*, Lin. s., *Fer. communis*, Desf., and described a number of allied species.

Sixteenth Annual Report of the Alumni Association, with the exercises of the Fifty-Ninth Commencement of the Philadelphia College of Pharmacy. 1880. 8vo, pp. 59.

The pamphlet contains various addresses, minutes, lists of members and graduates, etc. The officers for the current year are Hugh Campbell, President; Wm. W. Moorhead and Henry Trimble, Vice-Presidents; W. E. Krewson (8th and Montgomery Av'e.) Recording Secretary; L. E. Sayre, Corresponding Secretary, and Edward C. Jones (15th and Market Sts.) Treasurer. Copies of the various annual reports may be obtained from the Recording Secretary or Treasurer on enclosing to either one of these officers 10 cts. per copy, to pay for postage, etc.

Twenty-third Annual Report of the Council of the Pharmaceutical Society of Victoria, 1880, with list of members and honorary members. Melbourne, 1880.

First Report of the Pharmacy Board of Victoria. Melbourne, 1880.

There are now 607 pharmaceutical chemists on the register. Thus far eight convictions under the pharmacy act have been obtained for carrying on business without being registered.

The Pharmaceutical Register for 1879. Melbourne, 1880.

It contains the list of registered pharmacists, apprentices, etc., with residence, date of qualification, etc.

Nineteenth Annual Report of the Philadelphia Drug Exchange. 1880.

The officers for the current year are H. B. Rosengarten, President; John Ferguson, Vice-President; H. C. McIlvaine, Secretary, and Edward H. Hance, Treasurer.

Thirteenth Annual Report of the Alexian Brothers Hospital, Chicago, Ills., for the year ending Dec. 31st. 1879.

Muscle-Beating; or active and passive Home Gymnastics for healthy and unhealthy people. By C. Klemm, Manager of the Gymnastic Institution in Riga. With illustrations. New York: M. L. Holbrook & Co. 1879. Pp. 56. Price 30 cts.

Electricity in Medicine and Surgery, with Cases to Illustrate. By John J. Caldwell, M.D., Baltimore, Md.

Reprint from "Gaillard's Medical Journal," March.

Kreuznach, its Celebrated Bromide-ioduretted Elizabeth Spring and Mother-lye. Kreuznach, 1880.

THE AMERICAN JOURNAL OF PHARMACY.

JUNE, 1880.

KOUMYS.

By L. WOLFF, M.D.

Read at the Pharmaceutical Meeting, May 18th.

When, at the last pharmaceutical meeting, the question arose, how to prepare a good and reliable article of koumys by a rational method, I stated that my experience with it had long been of an unsatisfactory nature, but, after continued experiments, I had been able to obtain very good results.

There had appeared in the JOURNAL at various times in 1874 and 1875 directions and formulæ for the preparation of this milk wine, so much praised as a nutrient in wasting diseases, and justly much employed of late years in this country; but none of them served me towards preparing a koumys at all corresponding to that of the Kirghizians on the steppes of Asiatic Russia.

A very interesting article in the "American Journal of Pharmacy," 1874, p. 570, from the "Pharmaceutical Journal and Transactions," gives a very excellent description of the koumys cure, and the preparation of koumys, as practiced by the Tartars on their native steppes, but it leaves the distant pharmacist at this side of the Atlantic, where no Tartar mares nor mares' milk can be had, at a loss of how to reproduce it in this country.

H. and N. Schultze, of Berlin ("Amer. Jour. Pharm.," 1875, page 68), direct an addition of sugar of milk to cows' milk, and its fermentation by brewers' yeast; any one that has tried has probably succeeded as little in making koumys according to their directions as I have. Schwalbe in the same article contributed by Dr. A. W. Miller uses condensed milk, dissolved in water, to which he adds lactic acid and rum, puts it in a Liebig's bottle, and charges the whole with carbonic acid gas, and sets it in a warm room until fit for use.

In another article of the JOURNAL, 1875, page 261, the Russian method of fermenting mares' milk by a home-made yeast is quoted,

with still another one, 1875, page 83, from the "Allgem. Med. Centralzeitung," 1874, page 1108, recommends milk, grape sugar and fresh beer yeast to be fermented together at a temperature of 88°F. until fermentation has set in, when it is to be bottled, and shaken every fifteen minutes for the next forty-eight hours (not a very pleasant job).

In 1876 I formed the acquaintance of a Russian gentleman, visiting this city, who had made koumys in his native country, and together we experimented, but with very indefinite results, until we imported, at considerable expense, some of the original ferment from Russia, and with it prepared koumys, which certainly effervesced very much, had a rich, creamy appearance, did not coagulate in heavy curd, was slightly acidulated, but possessed a rank, acrid taste, which I attributed to the ferment, whose odor was certainly not very inviting. The consequence was that the koumys, which had been made at a considerable outlay, never enjoyed the reputation it ought to have acquired, and the costly ferment was gradually left to die out.

As the demand for it again increased, I was sorely puzzled how to make a koumys that would be all that is required of it, and that would possess all its virtues and properties. I tried in vain all the above-given methods, but invariably obtained sour milk with a heavy curd as a result, indifferently effervescing, while the taste was enough to cure any hankering the patient may have had after the coveted milk wine.

When considering the nature of koumys and its peculiar features, it appears evident that its properties must be largely due to the nutritious quality of the milk, along with the alcohol produced by the fermentation of its sugar, while its rich effervescence makes it readily digestible even to weak and enfeebled stomachs. The cause of success in its manufacture from mares' milk is undoubtedly due to the large amount of sugar of milk contained therein, which is 80 parts in 1,000 to 40.37 in cows' milk; while the albuminates in the former are but 16.41 to 54.04 in the latter (Ranke's "Physiology"), so that the object in view seems to be to increase the amount of sugar in the milk while decreasing the albuminates, should the latter be required.

As the sugar of milk when added to milk is not directly induced to fermentation by ordinary yeast fungi, I was soon led to substitute grape sugar for it, into which the former has to be changed before undergoing vinous fermentation, and which, though not in the same quantities, yields by fermentation the same results—carbonic acid gas and

alcohol. But still while following the directions of some of the above quoted authorities, I found my koumys soon to curd and sour—a most unsightly article, whose acetous odor forbade its use.

As I was inspecting, one day, the fermenting rooms of one of our larger breweries, I was struck by the low, icy temperature maintained there, and on inquiry was informed that if the temperature were allowed to rise the fermentation would be sure to prove wild, signifying sour or acetous fermentation. This showed me at once the reasons of my former failures, and when I applied the principle involved to my own koumys, I had the satisfaction of drawing from my bottles a rich creamy, homogeneous liquid, slightly acidulated, foaming like the choicest soda water, of an agreeable taste, such as I exhibit here a specimen of, and some of which has been used by many physicians in their practices with excellent results, proving a sustaining nutriment which was readily borne by even the weakest stomachs.

In concluding, I give the formula employed by me, by which I am certain every pharmacist can produce a good and reliable article, at a reasonable cost, which, with a remedy consumed in such quantities as this, is of no small importance, and I have no doubt that nothing would bar even its dispensing as a beverage at our soda fountains.

Take of grape sugar half an ounce ; dissolve in four ounces of water. In about two ounces of milk dissolve twenty grains of Fleischman's compressed yeast, obtained at any grocery store, or else well-washed and pressed out brewers' yeast. Mix the two in a quart champagne bottle, which is to be filled with good cows' milk to within two inches of the top ; cork well, and secure the cork with strings or wire, and place in an ice chest or cellar at a temperature of 50°F., or less, and agitate three times a day. At the expiration of three to four days at the latest, the koumys is ready for use, and should not then be kept longer than four or five days.

It should be drawn with a champagne siphon tap, so that the carbonic acid gas may be retained and the contents will not entirely escape on opening the bottle.

Philadelphia, May, 1880.

KOUUMYS, OR MILK WINE.

BY G. L. TRUCKENMILLER, PH.G.

* Read at the Pharmaceutical Meeting May 18.

I noticed in the May number of the "American Journal of Pharmacy" that a member present at the Pharmaceutical Meeting desired a formula for preparing "koumys." There are several manufacturers who prepare this food, each claiming superiority over the other.

The formula herewith presented has been tested and found to be equal to any in the market.

Skimmed milk,	Cong. i.
White sugar,	℥iv.
Yeast,	q. s.

Dissolve the sugar in the milk and bottle in quart champagne bottles, add two ounce of bakers' yeast to each bottle, cork and tie over, set in warm place until fermentation is well under way, then lay on side in a cool cellar. It will be ready for use in from three to four days.

A champagne tap is indispensable for drawing koumys.

An interesting pamphlet has been compiled by Messrs. C. A. Bowman & Co., Peoria, Ills., from which I will take the liberty of copying a few extracts which may be of interest to your readers:

"Koumys is a sparkling beverage, prepared from pure sweet milk, possessing greater nourishing, strengthening and blood producing powers than any other kind of food.

"It is held in high estimation by the physicians of all schools as a reliable remedy for dyspepsia, imperfect digestion, nausea, general debility, consumption, catarrhal affections, etc. Its constituents are those which produce blood, bone and muscle."

ON CHESTNUT LEAVES.

BY LEWIS JOSEPH STELTZER, PH.G.

From an Inaugural Essay.

Chestnut leaves should be gathered for medicinal use in the months of September and October, while still green; they possess a faint characteristic odor. When gathered in the early part of October they lose in drying 49 per cent. of their weight, retaining most of their green color, except the midrib, which changes to brown. They do not become brittle, and are, therefore, with difficulty reduced to powder.

The leaves contain a considerable amount of tannin and extractive matter. The powder cannot be percolated alone on account of swelling when water or alcohol is added. A fluid extract is made by repeatedly digesting the leaves in water and expressing the juice, adding glycerin and sugar and evaporating, as recommended by Prof. J. M. Maisch ("American Journal of Pharmacy," Dec., 1871). A tincture made in the proportion of two ounces of the leaves to a pint of diluted alcohol is also frequently used.

Chestnut leaves were first brought to the notice of the medical profession by Mr. Geo. C. Close, in the year 1862, but were used by some physicians and in domestic practice previous to that time. They have been used with good success as a remedy for whooping cough; appear to control the spasms and often cause their suspension in a few days. The fluid extract is probably the best preparation to use, as it contains the drug in a concentrated form and is not unpleasant to take. The tincture may also be used, but the objection to it is the large dose required and the amount of alcohol contained therein.

For the purpose of ascertaining some of the constituents of the leaves they were subjected to the following experiments:

The infusion possessed an astringent taste, producing with ferric chloride a greenish-black precipitate, and a copious precipitate with solution of gelatin, showing the presence of tannin. The infusion was deprived of coloring matter, tannin, etc., with solution of subacetate of lead, filtering, and separating lead with sulphydric acid. The liquid appears to be free from sugar. The cold infusion showed the presence of albumen when heated, and by the precipitate produced with solution of mercuric chloride. Alcohol precipitated gum, soluble in excess of water, and this solution was not precipitated with ferric chloride or sodium borate.

Ten grams of the ground leaves were boiled with successive portions of water until the soluble parts were all dissolved, the different solutions mixed, filtered and treated with solution of gelatin until it ceased to afford a precipitate. This was separated by filtration, washed, dried and weighed; the result was 1.70 gram, equal to about 0.9 gram of tannin. A repetition of this experiment gave nearly the same result. This experiment shows 9 per cent. of tannin present in chestnut leaves. After removing the tannin from the infusion by means of fresh hide the filtrate was not affected by ferric chloride, and was, therefore, free from gallic acid.

The alcoholic tincture possessed a dark green color by reflected light and brown color by transmitted light. Upon evaporation a dark green extract was obtained. Its solution in water, in which it is slightly soluble, gives a black precipitate with ferric chloride. A portion of the tincture was evaporated to a small bulk, thrown upon water and the insoluble portion filtered out, again dissolved in alcohol and treated with animal charcoal; when filtered the solution was colorless, and left no residue when evaporated. The solution of the extract in chloroform, when treated with purified animal charcoal, filtered and evaporated, left a small quantity of a soft, yellowish substance, probably resin. By the treatment of the leaves with petroleum benzin and evaporating a quantity of fatty matter is obtained, freely soluble in ether. Negative results were obtained when examining for an alkaloid and volatile oil.

One hektogram of the dried leaves was incinerated; 5.40 grams of ash of a light gray color was obtained, having an alkaline reaction.

Appropriate tests indicated the presence of carbonates, chlorides and phosphates of potassium, calcium, magnesium and iron, while the organic constituents of the leaves are tannin (9 per cent.), gum, albumen, resin (a trace), fat, extractive and lignin.

CITRIC ACID IN THE CRANBERRY.

BY GEORGE A. FERDINAND, PH.G.

From an Inaugural Essay.

The following experiments were made with the view of determining the nature of the free acid contained in the ripe cranberry, *Vaccinium macrocarpon*, Aiton:

The berries were bruised, boiled with water and strained; the residue was again and repeatedly boiled and the liquid expressed until the last portion thereof and the residue were neutral to litmus paper. The various liquids were then mixed and treated with alcohol to remove the pectin; the precipitated pectin was mixed with clean sand, dried at a temperature of 100°C., again placed on a filter and washed with alcohol until the washings gave a neutral reaction with moistened litmus paper. The mixed filtrates were concentrated to drive off the alcohol, after which the garnet-red liquid remaining was allowed to stand until cold, when it was saturated with calcium carbonate and solution of calcium hydrate. The filtrate and cold washings were boiled, evaporated to

one-half and filtered while boiling hot. On adding half its volume of alcohol to the filtrate a precipitate formed which was removed by filtration; twice its volume of alcohol was added to the filtrate, the resulting precipitate dissolved in acetic acid, alcohol added, and filtered. To this filtrate lead acetate was added, then ammonium hydrate to neutralization, and the precipitate, after repeated washings, was suspended in water, hydrogen sulphide passed through it, filtered, evaporated to half and treated as follows: (α) With solution of calcium hydrate no precipitate; (β) with lead acetate a barely perceptible precipitate that fell to bottom of the tube when boiled; (γ) boiled with nitric acid, evaporated to dryness, dissolved residue in water, added excess of sodium carbonate, filtered; treated filtrate with calcium chloride which produced a precipitate that was entirely dissolved in acetic acid. The above reactions having demonstrated the absence of malic acid, succinic acid was now sought for, but the failure of neutral ferric chloride to produce any change in the clear concentrated liquid filtered from the lead sulphide denoted the absence of this acid.

The original precipitate obtained by treating the juice with calcium carbonate and solution calcium hydrate was now examined. After being again well washed with cold water a portion thereof was placed in a tube, mixed with solution of potassium hydrate, triturated and allowed to stand for several hours, when the clear liquid was poured off and boiled. The failure of a precipitate to appear with this treatment is a sufficient proof of the absence of tartaric acid.

Another portion of the precipitate was now taken, an excess of sodium carbonate in solution added, boiled and filtered. The absence of oxalic acid in the filtrate was shown by the precipitate produced on the addition of calcium chloride, being wholly dissolved by acetic acid.

An examination for citric acid was made as follows: The juice of the berries was taken, boiled and while hot saturated with calcium carbonate and solution of calcium hydrate. This was placed on a filter, and the precipitate, after being thoroughly washed with boiling water, was collected and dried. It was then treated with cold water, filtered and to a portion (α) of the filtrate calcium chloride added, which upon boiling produced a white precipitate; (β) adding silver nitrate to another part of the filtrate produced a white precipitate which turned black only after long boiling; (γ) another portion of the solution being mixed with a few drops of solution of potassium permanganate and heated showed no reduction of the potassium permanganate. δ To the last

portion of the filtrate solution of calcium hydrate in excess was added, but no reaction was observable until the liquid was boiled, when a white precipitate formed which partially dissolved on cooling. These combined tests demonstrate the presence of citric acid.

Now to find the percentage of this acid in the cranberry, 100 grams were bruised and the juice obtained (by the process described above) was treated as before with calcium carbonate and solution of calcium hydrate. After being filtered, and the precipitate washed, the filtrate was mixed with more than an equal bulk of alcohol, again filtered and the resulting precipitate of calcium citrate dried at a temperature not exceeding 149°C. The anhydrous calcium citrate thus obtained was found to weigh 2.094 grams. The citric acid that can be produced therefrom is readily calculated, and amounts to $\frac{384 \times 2.094}{498} = 1.41$ gram.

An attempt was made to estimate the amount of free acid in the filtered juice by means of a decinormal solution of alkali, but, although the color of the liquid was changed when made alkaline, the change was so gradual that no accurate results could be obtained. For a like reason the change in the color of a litmus solution added could not be noted.

The cranberries used for the foregoing experiments were picked the first week in October and kept in good condition until required for this analysis, two months later.

COMMERCIAL EXTRACT OF *KRAMERIA*.

BY JOHN WILSON HOFFA, PH.G.

From an Inaugural Essay.

Having for several years past noticed the inferior quality of different extracts of *krameria* in the market I decided to give them a fair trial, and have obtained the following results:

The extracts were procured from different leading manufacturers of fluid and solid extracts. One hundred grains of each were powdered, and macerated for four days in 4 fluidounces of cold distilled water. At the expiration of that time the solutions were filtered, and the insoluble portions collected, carefully dried and weighed, thus giving the amount of insoluble matter in each.

One hundred grains of each extract were next treated with 4 fluidounces of boiling distilled water, macerated for four days, filtered and the insoluble portion dried and weighed.

As the quality of *krameria* depends upon the tannin present, it was determined by the gelatin test. One drachm of the finest gelatin was dissolved in 4 ounces of hot distilled water, and 15 grains of powdered alum added. By experimenting, I found that 31 drops¹ of this gelatin solution would precipitate 1 grain of tannic acid. The requisite quantity of the gelatin solution was added to the cold solutions of the extracts, with the results as shown in the table. The hot solutions were tested for tannin in like manner, and found to yield a small percentage more than the cold, although equally as varied.

From the results obtained it is evident that manufacturers have very different ways of making the extracts of *krameria*, and very few, if any, adhere strictly to the formula of the U. S. P., although the official formula yields a stronger and much more soluble extract.

After experimenting with hot and cold water, alcohol and a mixture of alcohol, water and glycerin, the most satisfactory results were obtained by the following formula:

Take of *Krameria*, in moderately fine powder; . . . 16 troyounces
Glycerin, $\frac{1}{2}$ troyounce
Distilled water, a sufficient quantity

Moisten the powder with 5 fluidounces of the distilled water, previously mixed with the glycerin. Pack it firmly in a conical glass percolator, and allow it to macerate for 48 hours; then gradually pour distilled water upon it until the drug is exhausted; then evaporate the percolate by means of a water-bath, at a temperature between 150° and 170°F., to the consistency of an extract.

The extract, weighing 9 per cent. of the powdered root, is completely soluble in cold and hot water, and indicates 31 per cent. of tannin.

The following table shows the amount of insoluble matter in some commercial extracts of *krameria*, also the quantity of tannin:

100 grains Commercial Extract of *Krameria* contain,

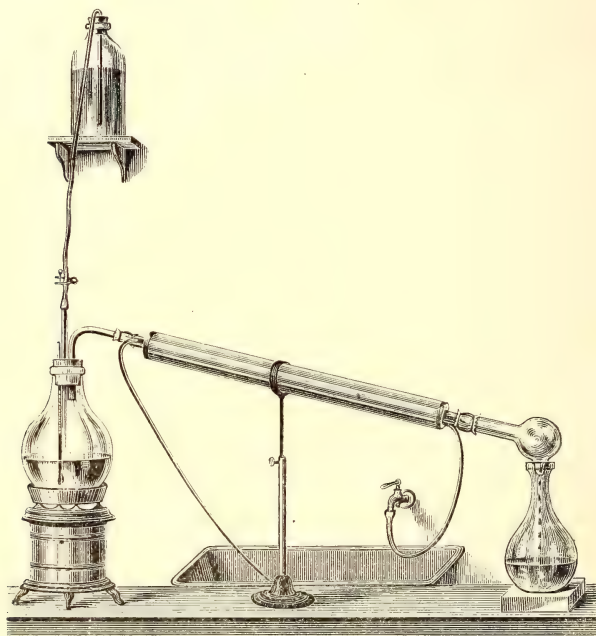
	Number of grs. insoluble matter in cold distilled water.	Number of grs. insoluble matter in hot distilled water.	Am't of tannin, grs
A	24	21 $\frac{1}{2}$	18 $\frac{1}{2}$
B	43	37	16 $\frac{1}{2}$
C	59 $\frac{1}{2}$	53	10 $\frac{1}{2}$
D	67 $\frac{1}{2}$	63	8
E	76 $\frac{1}{2}$	71 $\frac{1}{2}$	7
F	81	74 $\frac{1}{2}$	6 $\frac{1}{2}$
G	88	84 $\frac{1}{2}$	5 $\frac{1}{2}$
H	86	81 $\frac{1}{2}$	4 $\frac{1}{2}$

¹ Drops are a very unsatisfactory measure for quantitative determinations.—ED.

APPARATUS FOR PREPARING ETHYL BROMIDE.

BY JOSEPH P. REMINGTON.

The accompanying cut represents the apparatus used in preparing ethyl bromide (see page 248, May number of this journal). It consists of a four-liter flask, connected by a bent glass tube with a condenser. The cork is perforated to accommodate a thermometer and a small glass tube for the introduction of the alcohol.



The diluted sulphuric acid is introduced, the potassium bromide added, and, after making the connections tight, heat is applied until the contents of the flask show the temperature of 116°C . The alcohol, contained in a bottle, is elevated above the flask, and, by means of a siphon tube and pinchcock, is slowly fed into the flask, care being taken to adjust the flow of liquid and the heat so that the temperature range between 100° and 116°C . The advantage of this process is that the decomposition takes place at a temperature that can be controlled with ease, and the formation of ethyl bromide goes on regularly and without danger or risk. This apparatus may doubtless be serviceable for making other ethyl compounds.

AN IMPROVED FORMULA FOR CHLORODYNE.

By R. DE PUY.

The formula for preparing chlorodyne, adopted by the American Pharmaceutical Association, yields a very unpharmaceutical mixture, and, when tried, has failed to give satisfaction. The formula which I have been using for the last two years has given entire satisfaction, and, if the ext. liquorice be of good quality, does not separate. It is as follows:

Purified chloroform,	4 fl. oz.
Stronger ether,	1 fl. oz.
“ alcohol,	4 fl. oz.
Molasses,	4 fl. oz.
Ext. liquorice, B. P.,	2½ troy oz.
Morphia hydrochlorate,	8 grains.
Oil peppermint,	16 minims.
Glycerin,	17½ fl. oz.
Acid hydrocyanic, 2 per cent.,	2 fl. oz.

Dissolve the morphia and oil peppermint in the alcohol, and mix the chloroform and ether with this solution. Mix the ext. liquorice with the molasses by applying a gentle heat, let cool, and to this add the glycerin. Shake these two mixtures together, and lastly add the hydrocyanic acid, and again shake well. This is the American Pharmaceutical Association formula, having glycerin substituted for syrup, which I consider in every way an improvement.

—*Canad. Pharm. Journ.*, May, 1880.

PHARMACEUTICAL NOTES.

By ROBERT F. FAIRTHORNE, PH.G.

An Expeditious Method for Making Mercurial Ointment.—Many suggestions have been made for overcoming the difficulty experienced in the manufacture of mercurial ointment of the official strength of the U. S. Pharmacopœia. Some of the plans proposed are decidedly objectionable, such, for instance, as the introduction of turpentine or sulphur, also the addition of old and rancid ointment, or exposure of the ointment until rancidity occurs, so that it becomes a desideratum with the trade that some practical and unobjectionable means should be adopted whereby labor would be saved and an ointment made that would be bland and non-irritant in character. Such a method I have now to propose, which, doubtless, will give others the

same satisfaction as it does me, enabling them to accomplish in ten minutes what required an hour or two by the older process. This is accomplished by the addition of mercury and chalk (gray powder) in small portions at a time to the suet and lard, and proceeding in the same manner as directed in the Pharmacopœia. The weight of the mercury contained in the gray powder used is estimated and deducted from the amount ordered in the formula, so as to make an ointment containing 50 per cent. of that metal.

The following will be found to produce such a result, namely:

R	Mercury,	.	.	22	troyounces	
	Mercury and chalk,	.	.	5	"	2 drachms and 2 scruples
	Suet,	.	.	9	"	
	Lard,	.	.	11	"	5 drachms and 1 scruple
	M.					

Rub the mercury and 2 ounces of suet and a small portion of the lard together with an ounce of the gray powder until the globules become invisible; then add the remainder of the ingredients in successive portions, the suet having been softened by heat.

The above named quantity of mercury and chalk contains 2 troy-ounces of the metal and 3 ounces, 2 drachms and 2 scruples of chalk. This, therefore, renders it necessary to alter the proportions of suet and lard, so as to preserve the same consistence as the official preparation.

By adding the above ingredients together they will be found to weigh 48 troyounces, and will contain 24 troyounces of mercury. I do not think that the addition of the prepared chalk contained in the gray powder can be objected to for the purposes for which the ointment is used. It is certainly less objectionable than the addition of rancid or irritating substances.

How to keep Citrine Ointment from Changing.—Most druggists have experienced the difficulty of keeping citrine ointment so as to be able to dispense it in a manner satisfactory to themselves and to their customers, even a few weeks after being made, on account of change in color from the bright lemon yellow to a rusty brown, and from its becoming granular and friable by age. I have found that these difficulties can be overcome by allowing the freshly made ointment to be covered by a stratum of glycerin about $\frac{1}{2}$ of an inch deep, so that none of it should be exposed to the air. By this means I have preserved citrine ointment without change for more than a year, and I think it probable that it would remain unchanged for an indefinite period of

time. I think, too, that by this plan many other ointments and cerates could be kept. I shall try it with Goulard's cerate.

A Close Imitation of Curacao Cordial.—I have devised the following and found it a very good substitute for the imported curacao :

R	Fresh oil of orange peel,	.	.	.	10 drops
	" " lemon peel,	.	.	.	6 "
	Oil of aniseed,	.	.	.	1 "
	" cloves,	.	.	.	1 "
	" cinnamon (Ceylon),	.	.	.	1 "
	Alcohol,	.	.	5 fluidounces and 2 drachms	
	Simple syrup,	.	.	7 "	
	Orange flower water,	.	.	2 fluidrachms	
	Extract of fresh orange peel,	.	.	1 "	
	Water,	.	.	2 fluidounces 2 "	

Dissolve the oils in the alcohol, add the extract of orange peel, then the syrup, agitate for 10 or 15 minutes, and after the water is poured into the mixture shake well. After standing for an hour filter, after having previously mixed the cordial with 2 drachms of carbonate of magnesia in powder.

This produces a fine flavoring cordial, having a close resemblance to the genuine curacao, and miscible with water without becoming turbid. This makes the white curacao, and in order to make the colored all that is necessary is to add sufficient caramel to produce the desired tint.

EFFECT OF INTENSE COLD ON CHERRY-LAUREL.

BY PROFESSOR FLÜCKIGER.

In January, 1879, I submitted cherry laurel leaves, which were covered with ice, to distillation with water, and ascertained that they nevertheless yielded a small amount both of essential oil and hydrocyanic acid. This experiment is recorded in the new edition of the "Pharmacographia," page 256, yet it should be added that the leaves, although frozen, were still green and were not killed by the frost, the temperature being not below -10°C . (14°F). In the month of December, 1879, as well as in the beginning of the present year, however, we noticed repeatedly, at Strassburg, temperatures of -25°C . (-13°F), and then the cherry-laurel leaves turned brownish, lost their leathery texture and were in fact killed. Some of them, distilled with water, yielded an aromatic aqueous product which proved devoid of hydrocyanic acid. On repeating this experiment with one pound of the frozen leaves the same negative result was obtained, and the same again when two pounds of leaves were submitted to distillation. In

each case the first portions of the distilled liquid were tried for hydrocyanic acid with the usual tests, viz., sulphate of copper and guaiac, the production of sulphocyanate and that of Prussian blue. No trace of hydrocyanic acid was proved to be present by these means. Another distillation, like the former, also performed by using the leaves minutely cut, was carried on for an hour or two, so as to afford a large quantity of water, say about $1\frac{1}{2}$ gallon. It had nearly the usual odor of cherry-laurel water, yet no essential oil made its appearance. The whole quantity of the distilled water was now repeatedly shaken with ether; from the ethereal layers afterwards the ether was cautiously distilled off and the residue exposed to spontaneous evaporation at a temperature not exceeding 20°C . (68°F .). It afforded about $1\frac{1}{2}$ gram of an oily liquid reminding, not exactly of cherry-laurel oil, but a little suggestive of acetic or similar compound ethers, and displaying at the same time a certain pungency; it was of a decidedly acid reaction. Supposing it to be (impure) cherry-laurel oil, I thought it quite in accordance that small crystals began to be formed on the sides of the phial. To investigate the nature of the essential oil I shook it with a saturated solution of bisulphite of potassium, SO_3KH , after having ascertained that this solution immediately combined with true benzylic aldehyd, *i. e.*, essential oil of laurocerasus, yielding crystallized scales of the compound $\text{C}_6\text{H}_5\cdot\text{COH}\cdot\text{SO}_3\text{KH}$. But such was by no means the case with the oily liquid which had been extracted from the water. And as to the small crystals which had separated from the same oily liquid, they proved not to be benzoic acid inasmuch as they readily melted at about 60°C . (140°F .). Nor was it possible to ascertain the cause of the acid reaction of the oily liquid; it was due neither to formic acid nor to any other acid of the fatty series. The aqueous residue in the still was duly concentrated and found to be very rich in mucilage and uncrystallizable sugar.

These experiments, which were for the most part performed by Mr. Fels, a pupil of mine, show that the source of hydrocyanic acid and benzylic aldehyd in the laurel leaves is destroyed by intense cold. A minute quantity of an essential oil is still afforded by the leaves, but it does not agree with the oil as yielded by the living plant. Dried leaves are sometimes said likewise to yield no longer any hydrocyanic acid; I am not able to confirm this statement, having ascertained that fresh cherry-laurel leaves, which I dried for several days at the temperature

of the water-bath, on distilling them with water afforded a small amount of the said acid.

I am informed that in December and January past *Prunus lauro-cerasus* has been injured throughout northern Italy as far as Bologna and Florence in the same way as with us. It would be interesting to know a little more exactly the area of this action of cold on the shrub, which is so widely spread also in the south of the British Isles.—*Pharm. Jour. and Trans.*, March 20, p. 749.

CONTRIBUTIONS TO THE CHEMISTRY OF SEVERAL VARIETIES OF WAX.

BY EDUARD HIRSCHSOHN, Mag. Pharm.

The reactions I obtained with the different resins, etc., described in the "Archiv der Pharmacie," can be made use of as a good means not only of distinguishing the various resins, gum resins, and balsams from one another, but also of recognizing the more important commercial varieties of the same by means of chemical reactions. It did not, therefore, appear without interest to subject the varieties of wax more commonly met with in the market to a similar examination.

For this purpose I made use of the samples in the collection of the Pharmaceutical Institute of this town, kindly placed at my disposal by Professor Dragendorff, to whom I take this opportunity of expressing my sincere thanks. The experiments with the same described in the following lines were carried out, with but few exceptions, in precisely the same way and with the same reagents as in my previous investigations.

I was able to avail myself of the following samples :

1. *Cera flava* ; from a chemist in Dorpat ; fine pure sample.
2. *Cera flava* ; produced in 1877 in Rappin in Livonia. Also a very fine sample.
3. *Cera alba* ; in the collection of the Pharmaceutical Institute ; fine white pieces.
4. *Cera alba* ; from a chemist in Dorpat ; good sample.
5. *Cera alba* ; from the Martiny collection ; similar to No. 4.
6. *Cera africana* ; also from the Martiny collection ; very similar to European beeswax, but softer and of a greyish yellow.
7. *Cera mexicana* ; from the Martiny collection ; is a white beeswax.

8. *Cera de Orizaba*; also from the Martiny collection, where the following note is appended to it:

“Received from Schaffner, with the remark that it was in this state offered for sale by the Indians. I have not investigated it more closely, but after a superficial examination I take it for a vegetable wax.”

The examination shows it to be a *Myrica* wax.

9. *Cera japonica*; in the collection of the Pharmaceutical Institute; usual commercial variety.

10. *Cera japonica*; from the Martiny collection; similar to No. 9.

11. *Cera from Myrica quercifolia*; also from the Martiny collection; a pale green-mass, tolerably hard and easily powdered.

12. *Cera from Myrica cerifera*; from the Martiny collection; somewhat darker and more brittle than the foregoing sample.

13. *Cera from Myrica?* (species not named); from the Martiny collection; similar to No. 12. May be distinguished from No. 11 only by its darker green color.

14. *Cera de Bahia*; also from the Martiny collection; very hard grey mass, the freshly fractured surface greenish.

15. *Cera Brasiliensis*; from the Martiny collection; light yellowish mass, brittle and easily powdered.

16. *Cera e Lac in baculis*; also from the Martiny collection; chocolate-brown brittle mass, easily powdered.

17. *Carnauba wax*; obtained in 1878 from Gehe & Co., in Dresden; similar to No. 15.

Alcohol (95 per cent.), in the proportion of 1 part of wax to 10 of alcohol, dissolved only a small portion of the samples under examination. On warming to the boiling point, sample No. 8 and 11 to 13 were completely dissolved, whilst with samples 1 to 7 and 9 and 10¹ the greater part of the wax melted and collected in the form of an oil at the bottom of the test tube. With No. 14 to 17 on the other hand the undissolved portion remained as a powder. Part of the dissolved wax separated out of the hot solutions on cooling, colorless.

Alcoholic solution of acetate of lead gave with the above cooled alcoholic solutions of samples No. 1 to 13 and 16 a cloudiness which on heating to boiling completely disappeared in Nos. 1, 2 and 6 to 13, in Nos. 3 to 5 and 16 partially only. In Nos. 14, 15 and 17 no change was caused by the addition of the acetate of lead solution.

¹ Japanese wax dissolved completely on boiling with a larger quantity of alcohol.

Solution of ferric chloride (1 part in 10 of 95 per cent. alcohol) added to the alcoholic solution of the wax colored No. 13 black, with the others it produced either no alteration or a brownish or greenish tint. In No. 11 a cloudiness was produced, insoluble on warming.

Solution of ammonia (sp. gr. 0.96, gave with the alcoholic solutions a more or less opalescent mixture.

Ether, at the ordinary temperature, dissolved Nos. 8 and 11 to 13 completely, the remainder partially only. Of these Nos. 1 to 7 and 9 and 10 were completely dissolved on boiling and, as with the hot alcoholic solutions, the greater part separated out on cooling, colorless. The addition of an equal volume of 95 per cent. alcohol to the etheral solutions, obtained at the usual temperature, produced no alteration in Nos. 8, 11 to 14 and 16, whilst in Nos. 1 to 7, 9, 10, 15 and 17 a cloudiness appeared.

Chloroform dissolved at the ordinary temperature, samples Nos. 1 to 13 to a perfectly clear solution; Nos. 14 to 17 were only partially dissolved, but on heating dissolved completely, the greater part separating out colorless on cooling.

Petroleum spirit at the ordinary temperature effected only a partial solution which on boiling became complete. On cooling the wax separated out colorless.

Alcoholic solution of caustic potash (1 part caustic potash in 10 parts 95 per cent. alcohol) on only slightly warming dissolved the Japanese and Myrica wax (Nos. 8 to 13) completely, and the remainder (Nos. 1 to 7, 14 to 17) required to be boiled for some time before solution could be effected. On heating the cooled soap solutions with about 100 parts of water, the soaps from Japanese and Myrica wax dissolved completely, the other soaps only partially.

Quantitative experiments also were made with some of the samples as follows: The wax was brought to the finest possible powder with powdered glass and treated with alcohol or petroleum spirit at the ordinary temperature, as long as anything was removed by the solvent. From the solutions thus obtained, the alcohol or petroleum spirit was recovered by distillation, and the residue dried at 110°C.

The following figures were obtained:

	Alcohol, 95 per cent.	Petroleum spirit.
Cera africana, . . .	3.50	49.28
Cera de Orizaba, . . .	10.22	
Cera japonica, . . .	14.00	69.80
Cera Myrica quercifolia, . . .	16.16	53.62
Cera Myrica cerifera, . . .	7.16	41.62
Cera Myrica, ? . . .	19.88	68.70
Cera Bahia, ¹ . . .	9.70	3.32
Cera braziliensis, . . .	3.25	5.04

The quantitative experiments show that, with the exception of Bahia wax, the solubility in petroleum spirit is much greater than in alcohol.

From the quantitative results it is evident that the behavior of the samples of wax under examination with chloroform renders admission into two groups possible, viz., such as are completely soluble in that medium, as the Myrica and beeswax, and such as are only partially dissolved by it, as Brazilian and Bahia wax. Further, their comportment to ether allows of a similar division, and here the Myrica wax alone is completely dissolved, beeswax and Bahia wax on the other hand only partially. The effect produced by the addition of acetate of lead solution to the alcoholic solutions can also be made use of, as a means of distinguishing the various varieties of wax, since Brazilian and Bahia wax are not rendered turbid, whilst the contrary is the case with all the other samples, in some of which the cloudiness disappears on warming, in others it does not.

These peculiarities allow of the several varieties of wax being well distinguished from one another, and the following scheme will, I think, be found to answer that purpose.

A sample of the wax to be examined is heated with ten times as much chloroform to boiling, and, when completely dissolved, cooled in cold water.

I. The chloroformic solution remains clear after cooling.

A. Ether dissolves completely.

(a) Alcoholic solution of ferric chloride gives with the alcoholic solution of the wax a precipitate insoluble on heating.

Wax from Myrica quercifolia.

(b) Ferric chloride colors the alcoholic solution black.

Wax from an undetermined species of Myrica.

(c) Ferric chloride colors brownish but gives no precipitate.

Wax from Myrica cerifera. Wax from Orizaba.

¹ Ether dissolved 10.52 per cent. of this sample.

B. Ether dissolves only a part—

A sample is boiled with ten times the quantity of alcoholic potash solution till saponified and the soap heated with 100 volumes of water.

(a) The soap is completely soluble.

Japanese wax.

(b) The soap is partially soluble.

Beeswax; African beeswax.

II. The chloroformic solution becomes cloudy on cooling.

A. Alcoholic solution of acetate of lead gives no cloudiness.

(a) The ethereal solution of the wax becomes cloudy on the addition of an equal volume of alcohol.

Brazilian and Carnauba wax.

(b) The ethereal solution remains clear.

Bahia wax.

—*Pharm. Jour. and Trans.*, March 20, p. 749.

Origin of the CALISAYA LEDGERIANA of COMMERCE.

BY JOHN ELIOT HOWARD, F. R. S.

I have been induced to review the question of the origin of the now celebrated bark above named, and am able to publish for the first time details which, at the request of Mr. Ledger, I withheld in 1876, when I gave extracts from his letters in my "Quinology of the East Indian Plantations."

We are indebted not to systematic botanists, but to the experience and practical sagacity of an Indian, for our knowledge of the best kinds of calisaya bark; whilst to Mr. C. Ledger belongs the whole credit of the enterprise of obtaining the precious seed to which the hope of future success attaches in Java and perhaps in other parts of the East Indies.

I have pleasure in now recording the name of the above-mentioned Indian servant of Mr. Ledger—Manuel Incra Mamani—to whom was entrusted in 1861 the commission of obtaining the seed of the best calisaya. At page 48 of my (unfortunately) little accessible "Quinology of the East Indian Plantations" will be found many details, but I now quote more fully from Mr. Ledger's original letters. Under date December 22, 1874, I find the following:

"Manuel Incra Mamani delivered the seed he had collected in June, 1865. He then told me that the best bark trees had not produced ripe seed for four years previously. When the trees were full of flower and most promising a frost (*helada*) in April destroyed it all. The inferior

sorts had not suffered. He had been cutting bark with his sons and patiently waited for opportunity for complying with my orders, obtaining only the best sort.

"He assured me, too, he had seen several parties collecting seed for gentlemen in La Paz; that they did not obtain a single good seed till 1865; and this assertion seems now to be corroborated by result of Schuhkraft's remittances in those years. (See further).

"After paying him well, he returned to his home in Bolivia, having engaged with me before leaving to obtain more seeds of the Rojo, the Morada, the Naranjada, the calisaya of Moco moco."

The sequel is a sad one. After relating the particulars of the murder of another servant (Babrera), Mr. Ledger says:

"Poor Manuel is dead also; he was put in prison by the Corregidor of Coroico, beaten so as to make him confess who the seed found on him was for; after being confined in prison for some twenty days, beaten and half starved, he was set at liberty, robbed of his donkeys, blankets and everything he had, dying very soon after."

The first portion of the above seed passed into the hands of the Dutch Government. In my work the reader will find particulars about the reception in Java. Owing to Mr. Ledger's good drying and care, the seed arrived in such condition that it had not lost its germinative power. I inspected the remainder at the request of the British purchasers, and found it apparently of the best quality and condition. The capsules reminded me of those of "*Cinchona calisaya*, var. *microcarpa*, Wedd.," published by Dr. Weddell in the "*Annales des Sciences Naturelles*," 1870. This I recognize as the source of the Zamba sort, of which I have magnificent specimens. Dr. Weddell says: "*Les cascarilleros du pays me l'ont signalée comme donnant une écorce supérieure en qualité a celles des autres variétés croissant dans les mêmes lieux, et j'avoue que j'ai été heureux de voir cette appréciation de l'homme des bois confirmée par M. Howard.*"

In fact it is only in this description that Dr. Weddell approached the best sorts, the *Calisaya vera* being by no means equal in produce.

In his second journey Dr. Weddell obtained specimens of the Zambita, Verde and Morada varieties of calisaya, of which he obligingly gave me specimens, which are now before me. The bark of these sorts, especially the Zambita and the Morada, resembles considerably that of the Ledgeriana.

I do not assert entire identity. The seed producing the Ledgeriana

was gathered, according to Manuel, from about fifty trees, chiefly of the Rojo sort. These different forms of the best calisaya are distinguished by the carcarilleros by the color of the leaves; and Ledger thinks my plate of the *Calisaya anglica* resembles in the color of the leaf that of the Rojo. Elsewhere he gives me, as descriptive of the same, that of *sangre de toro*, or bull's blood. The variation in the color and form of the leaves does not seem to have any connection with the value of the bark.

I have said that Dr. Weddell published the Zamba or Zambita sort as the var. *microcarpa*, but not having seen the flowers, his description leaves much to be desired. The *Calisaya Ledgeriana* of Java is, as I have shown, the legitimate produce of the seed of the fifty trees above mentioned. I should think that no botanist has been within some hundred miles of the almost inaccessible banks of the Mamore, where these were met with, or of the Beni, where Pedro Rada collected from trees (as he told me), from 120 to 150 feet in height, some of the finest calisaya bark ever brought into the English market; conveying his precious cargo by the long and perilous navigation of the Rio Madeira, as I described in Seemann's "Journal of Botany" in 1869. This sort was called Morada; and if the colored drawing given there is compared with my plate V in "Quinology of the East Indian Plantations," it will be found closely to resemble.

We have then no means of further botanical description, except from Java; and from thence I have been supplied with forty-four excellent specimens, comprising all the barks cultivated. These I fully described in the work above named, and from these published the first description of the sort as "*Cinchona calisaya*, var. *Ledgeriana*, How." The *Ledgeriana* has a peculiar character, to be recognized in the seedlings at a very early stage, but variable as to form and color in the after-growth. It must be admitted that the most striking characteristic of the *Ledgeriana* is the bark, which is at once recognizable by a person familiar with these observations; but scarcely capable of being made the basis of botanical definition. The flowers are also described as small, white and "nutantes;" but I am not certain that this is capable of being asserted without some slight modification. I hope to succeed in flowering my own specimens, which I would then describe more perfectly. On the whole I have found it best to present to the reader of my book three forms of the plants, relatively (according to the analysis of the flower) the *male*, *female* and *neuter* forms—that is those in

which the above elements preponderate, or are in even balance. The male (*macho*) plants in the cinchonæ are always the most highly colored.

The male, or *macho* form (plate IV), is the most colored (and should be more of the *bull's blood* color). The contents of this bark, as given from the tree itself by Moens are (per cent.):

Quinia,	.	.	.	.	.	.	.	9.06
Cinchonia,	.	.	.	.	.	.	.	0.10
Amorphous alkaloid,	.	.	.	.	.	.	.	1.40
Total,	.	.	.	.	.	.	.	10.56

The female form (*hembra*), plate V, has leaves of a green color, and gave to the same chemist:

Quinia,	.	.	.	.	.	.	.	9.90
Amorphous alkaloid,	.	.	.	.	.	.	.	2.09
Total,	.	.	.	.	.	.	.	11.99

(Of this I have given a fine plant to one of our Ceylon cultivators, who is about sending it out to India.)

The third form, plate VI, gave:

Quinia,	.	.	.	.	.	.	.	9.97
Amorphous alkaloid,	.	.	.	.	.	.	.	1.70
Total,	.	.	.	.	.	.	.	11.67

Compare these with "*Calisaya Javanica*," of Hasskarl, which gave (in average of 18 samples, 1879, Moens):

Quinia,	.	.	.	.	.	.	.	0.70
Cinchonidia,	.	.	.	.	.	.	.	0.50
Quinidia,	.	.	.	.	.	.	.	0.30
Cinchonia,	.	.	.	.	.	.	.	1.20
Amorphous alkaloid,	.	.	.	.	.	.	.	0.30
Total,	.	.	.	.	.	.	.	3.00

and the "*Calisaya Javanica*," of Schuhkraft (average of sixteen samples, 1879, Moens):

Quinia,	.	.	.	.	.	.	.	0.50
Cinchonidia,	.	.	.	.	.	.	.	0.30
Quinidia,	.	.	.	.	.	.	.	0.20
Cinchonia,	.	.	.	.	.	.	.	1.20
Amorphous alkaloid,	.	.	.	.	.	.	.	0.20
Total,	.	.	.	.	.	.	.	2.40

It must be well understood that none of these sorts originated in Java, but were and are well distinguished as "best" and "inferior" in their native country.

The idea of any of them originating by *crossing* in the Java plantations is therefore perfectly illusory.

If asked how they originated in their native forests, the answer must be, that of this we are entirely ignorant. We approach the question so well investigated by Alexis Jordan as to the varied forms of European flowers. Although I have described the *Ledgeriana* as a *variety* of the *Calisaya vera*, it is only as conforming to the present state of botanical science that I use the word. It is as consistent with common sense to believe that by fusing together a half-crown and a penny one could produce a sovereign, as to believe that by blending inferior varieties one could educe the *Calisaya Ledgeriana*, the best, by far, of all. I do not at all deny that hybridization takes place in the plantations in India, nor that in some cases good results may follow. The only practical inquiry into this question was carried on by McIvor, who thought he had attained a great success in a *pubescent* hybrid, from which he sent me some good bark; but when afterwards, with much pains and care, he was good enough to send me a section of the tree, it was quite different, and a correspondent of mine in the Wynaad informs me that, as sent to him, it is altogether a failure. Specimens both of the good bark and of the tree may be found in the Museum.

If my readers will take a map of South America, they will find the distance from Coroico (Calisaya district) to Huanuco (grey bark) is 680 miles; from Huanuco to Loxa (crown bark) is 500 miles; from Loxa to Riobamba (red bark) is 180 miles; from Coroico (Calisaya) to Pasto (Pitayo bark) is 1,400 miles; and from Coroico to the Lancifolia and Cordifolia district is 1,500 miles. We need not, then, suspect any interference of the pollen at these distances. In fact, all that we can recognize is the existence of permanent allied forms; and the difficulties are insuperable, even in imagination, in conceiving how they could have diverged from one centre. It is like the attempt to find a common centre for several intersecting circles.

It is no doubt very inconvenient to the systematic botanist to admit this; but to distort facts and suppress all that we have already gained in knowledge of *nature* for the sake of *system* is simply absurd.

The *Calisaya Ledgeriana* is, then, the legitimate descendant of the finest sort (or sorts) of the Bolivian forests; subsisting even there

under different forms, especially distinguished by the color of the leaves, but agreeing in the production of a large amount of very pure quinia. The flowers appear in South America to be very sensitive to frost, but they are abundantly fertile under favorable circumstances; 20,000 plants were raised by Van Gorkom and 60,000 by McIvor from the one bag above described. The climate at Ootacamund did not suit. Nevertheless, some of the trees, though stunted and mostly perishing, have produced excellent bark. The reason why it is not more largely sent into Europe is, I understand, that in Java they are wisely thinning out the inferior trees and allowing the best to develop themselves. In British India, on the contrary, I am afraid many of the best "succirubra" and "officinalis" trees are being cut down. I thus send for the information of your readers a few facts which may be of interest, and in conclusion must express my regret that those who have toiled and suffered in introducing these valuable trees into India should have been so ill rewarded. Ledger lost his time and his servants, and yet both the British and Dutch governments refuse him the slightest compensation for his losses.—*Pharm. Jour. and Trans.* [Lond.], March 13, 1880.

NOTE ON CANTHARIDES.¹

BY HENRY G. GREENISH.

In the autumn of last year, a sample of cantharides was handed to Professor Dragendorff, of the Pharmaceutical Institute, by a chemist of this town, with the remark that he had not succeeded in preparing an active Drouott's plaster from the flies, and doubted, therefore, their good quality.

I willingly acceded to Professor Dragendorff's request to determine quantitatively the amount of cantharides in the sample, and, in doing so, followed the method indicated by him in "*Die chemische Werthbestimmung einiger starkwirkender Drogen*,"² which is briefly as follows:

25 to 30 grams of the powdered flies are freed from oil by treatment with petroleum ether. Cantharidin, being not insoluble in petroleum ether, a correction must be made in the amount of cantharidin found to compensate for the loss incurred by treatment with this solvent.

¹ Read at an evening meeting of the Pharmaceutical Society of Great Britain, March 3, 1880.

² St. Petersburg, 1874.

This loss has been determined by Dragendorff to be for 100 cc. petroleum ether 0.0108 gram cantharidin.

The flies, freed from oil, are now thoroughly moistened with solution of soda, and the mass thus produced dried in a porcelain dish on the water bath. By this treatment, during which quantities of ammonia gas are evolved, a soluble cantharidate of soda is formed, which is subsequently decomposed by hydrochloric acid. It must be borne in mind that not all the cantharidin in the flies is present in the free state. Dragendorff has already shown¹ that cantharides containing about 0.3 per cent. cantharidin yielded only half that quantity to boiling water, the remainder being extracted by solution of potash. Among the combinations of cantharidin insoluble in water occur probably salts of lime and magnesia; among the soluble, cantharidic acid, possibly cantharidate of ammonia, etc. (the ammonia being derived from the albuminous substances by their decomposition during the drying of the flies).

The dried mass (containing now cantharidate of soda) is removed from the dish and finely powdered. It is then transferred to a flask, 25 to 30 grams of chloroform added, and the whole rendered strongly acid by the addition of dilute hydrochloric acid. This is then well shaken with from 25 to 30 grams of pure ether, the ether-chloroform solution separated and shaken with distilled water. The shaking with ether is repeated until cantharidin ceases to pass into solution. The major part of the ether can be recovered by distillation, the residue being allowed to evaporate to dryness in a flat-bottomed glass dish. This residue is then transferred with the aid of a small quantity of absolute alcohol to a tared filter, and washed first with alcohol and then with two or three cubic centimeters of water. Should traces of oil still adhere to the cantharidin they may be removed by washing with petroleum ether. The quantities of these liquids used must be noted, since a slight correction has to be made, viz.: for 10 cc. alcohol 0.0077 gram; for 1 cc. water 0.0005 gram. The washed cantharidin is dried at 100°C., weighed and the corrections for petroleum ether, alcohol and water added to the figure so found.

Proceeding in this way 31.1405 grams of the flies in question yielded me 0.2022 gram of nearly white cantharidin. The corrections for petroleum ether, alcohol and water amounted to 0.0303 gram, total cantharidin 0.2325 gram, equivalent to 0.746 per cent. This is

¹ "Pharmacist," v. 78; "Pharm. Jour." [3], ii. 1029.

largely in excess of the amount of cantharidin found by Dragendorff in good samples of Spanish flies, viz.: 0.351 to 0.5 per cent., and serves to illustrate in a striking manner the remarks on cantharides by that chemist, published in the "Pharmacist:"¹

"Apothecaries frequently complain that some cantharides do not furnish an active blistering plaster; that the same furnish, even when treated with acetic ether, an extract so poor in cantharidin that with its aid no good Drouott's blistering tissue can be produced. In most cases the opinion is expressed that the flies contain too small a percentage of cantharidin. My experience teaches me to discredit the latter opinion. It is possible to obtain good preparations even from such apparently poor cantharides, it being only necessary to thoroughly extract the cantharidin they contain. . . . I would say that by the aid of soda or potassa the entire amount of cantharidin contained in the flies may be rendered active. The finely powdered flies are mixed to a paste with diluted alkaline lye of about 1.1 sp. gr., heated in the water bath for twenty-five to thirty minutes, when sufficient muriatic acid is added to have a trifling surplus of the same, and the whole mass is dried rapidly in the water bath. The residue, which we may call prepared cantharides, is powdered anew, and employed for the preparation of the plaster, or for the extract with acetic ether for use upon tissue."

Had the Spanish flies examined been subjected to this treatment with solution of soda and hydrochloric acid, they would have yielded a blistering plaster of the activity of which there would have been no doubt.

I am able to give a further proof of the very imperfect nature of the exhaustion of the flies by ether in the estimation of cantharidin in the residue after treatment with that menstruum. Forty pounds of such residues were sent to Professor Dragendorff by a house in St. Petersburg engaged in the manufacture of large quantities of Drouott's plaster. The treatment of a kilogram had yielded such an unexpectedly large quantity of cantharidin as to offer an inducement to estimate the same more exactly.

29.297 grams of the exhausted flies, finely powdered, yielded me 0.2218 gram of nearly pure cantharidin; correction for alcohol and water 0.0192 (the flies having been previously exhausted with ether no correction for petroleum ether was necessary); total amount 0.2410 gram, equivalent to 0.822 per cent. of cantharidin.

¹ Loc. cit., p. 79.

The average quantity of oil removed by ether being about 12 per cent., we may reckon the amount of cantharidin in the original flies not extracted by ether to be 0.723 per cent., and assuming the cantharides to have been equally rich in cantharidin with the first sample the amount of that principle extracted by ether would amount to only 0.023 per cent.

Manufacturing druggists would do well, therefore, to turn their attention to their cantharides residues, especially such as have been extracted with simple solvents (ether, alcohol, etc.), in which salts of cantharidin are insoluble. The marc, for instance, from tinct. cantharidis still contains a considerable proportion of cantharidin. The only English price list at my disposal, that of Messrs. Southall Brothers, quotes cantharidin at 1s. per grain, and leaves no doubt of the profitability of working up residues containing $\frac{3}{4}$ per cent. of that principle.

That other species of *cantharis* may excel *cantharis vesicatoria* with regard to the amount of cantharidin contained in them is shown by the estimation of a sample of *cantharis adspersa* presented to the museum of the Pharmaceutical Institute by Professor Arata, of Buenos Ayres. Although the flies arrived mouldy and in bad condition I succeeded in obtaining from 12.3195 grains of dry insects 0.2917 of very nearly pure white cantharidin; correction 0.0256; together 0.3173 gram; equivalent to the very large amount of 2.573 per cent. Noticeable in this sample and in the first sample of *cantharis vesicatoria* is the comparatively small quantity of fixed oil. While Dragendorff finds as an average in good cantharides 12 per cent., I have obtained from *cantharis vesicatoria* (approximately) 7.7 per cent., and *cantharis adspersa* only 2.6 per cent. Possibly the weather prevalent during the life of the insect, the age of the same, etc., may have an influence on the amount of oil and cantharidin.—*Pharm. Jour. and Trans.*, March, 13, 1880.

ETHEREAL OIL OF CALIFORNIA BAY TREE.

BY J. M. STILLMAN.

The California bay tree, known under the different botanical names of *Oreodaphne Californica*, *Laurus Californica*, *Tetranthera*, and latterly *Umbellaria Californica*, is a large and beautiful evergreen tree, very common to the valleys and water-courses of the coast mountains of California. It often attains great size, and its timber is much used under the name of "California laurel" for veneering and fine cabinet

work. The leaf is in shape something like the laurel, but lighter in color and narrower. Both leaf and wood have a very fragrant aromatic odor, which, when strong, as in the crushed leaf, excites the mucous surfaces, brings tears to the eyes and produces headache.

The oil was obtained by distilling the leaves (which were gathered in March, 1879, when the trees were in bloom) with steam. In the neighborhood of sixty or seventy pounds of the fresh leaves were placed in a large barrel with perforated false bottom, and steam from the escape pipe of a steam boiler forced through the mass and condensed. In order to avoid the accumulation of too large an amount of water, this was siphoned off from the bottom of the receiving bottle, the siphon dipping into a dish of water by the side of the bottle, and the overflow of this dish kept the water in the bottle at a constant level. At the end of two days there were obtained in this way 820 grams of the oil. The oil as thus obtained is of a clear yellowish or straw color, of the peculiar aromatic odor of the leaf, specific gravity at 11°C . 0.94. By long standing (nearly a year) it does not thicken.

Subjected to fractional distillation it gives up a small quantity of dissolved water, and separates into two principal fractions, one boiling from 170 to 190°C . and the other from 210 to 225° , with smaller quantities passing over as high as 260° .

The lower fraction mentioned was subjected to repeated fractional distillation, and gave a considerable quantity of a clear, colorless, mobile liquid boiling at 167 to 168° , though apparently with slight dissociation, as traces of water appeared in the first portions of the distillate at each distillation, which were not to be got rid of by repeated distillation and removing the first portions of each distillate. A portion of the purest of this substance from 167 to 168°C . was subjected to elementary analysis:

		I.	II.	Mean.	Calculated for $\text{C}_{20}\text{H}_{32}\text{H}_2\text{O}$.
C	...	82.91	82.46	82.68	82.76
H	...	11.93	11.68	11.80	11.72

It will be seen that the agreement is very close with the composition of a hydrate of turpentine in which one molecule of water is combined with two of $\text{C}_{10}\text{H}_{16}$ or one of $\text{C}_{20}\text{H}_{32}$.

This agrees with the terpinol of Wiggers, investigated and named by List, and obtained in various ways from the turpentine dihydrate $\text{C}_{10}\text{H}_{16} \cdot 2\text{H}_2\text{O}$. The boiling point of terpinol is given at 168° , and it is a colorless liquid of pleasant aromatic odor. The odor of the com-

pound analyzed is not unlike that of spirits of camphor, though not quite identical.

It is not readily affected by metallic sodium, even when heated with it. The water is therefore in intimate combination, possibly as an ether $(C_{10}H_{17})_2O$.

A vapor density determination was made by Mr. J. B. Wilcutt according to Victor Meyer's method, in diphenylamine vapor. The result in one case gave 4.7, whereas the vapor density calculated for $C_{20}H_{34}O$ would give 10.0. If, however, dissociation should take place, splitting up the molecule into $C_{20}H_{32} + H_2O$, the vapor density of the mixture would be 5.0, not so far from the result obtained. That dissociation would take place was to be foreseen from the behavior on distillation, and was confirmed by the fact that after the operation the contents of the apparatus no longer had the original camphor-like odor, but possessed a distinct, rank odor of turpentine. It was also noticed that the compound itself by long standing bleached the cork of the test tube, probably due to traces of the free $C_{20}H_{32}$ resulting from the distillation.

An analysis was made of a fraction boiling at 171 to 172° , which gave $C=81.39$; $H=11.40$. Evidently, therefore, a mixture of the above with the more oxygenated, higher-boiling constituent, umbeliol, $C_8H_{12}O$.

The higher fraction (210 to 225°) was also subjected to fractional distillation and a compound obtained in considerable quantity, boiling without decomposition at 215 to 216° (uncorrected). This substance is also a colorless mobile liquid of aromatic but powerful odor, which, too strongly inhaled, attacks the mucous surfaces and causes headache. It is but slightly volatile, a quantity in an open watch-glass losing one mg. in an hour and a half. With concentrated sulphuric acid it gives a blood-red color, turning to brown and black. Water separates it from its solution in the acid. It is acted on violently by sodium, forming a blood-red, brittle, resinous substance; it is also acted on violently and decomposed by strong nitric acid. Elementary analysis gave

		I.	II.	III.	Calculated for $C_8H_{12}O$.
C	...	77.28	77.27	77.17	77.42
H	...	9.74	9.53	9.57	9.67

The vapor density determined, with the assistance of Mr. F. Slate, according to Victor Meyer, in diphenylamine vapor gave 4.33; calculated for $C_8H_{12}O=4.29$. The formula is, therefore, $C_8H_{12}O$.

It is isomeric, as far as I know, with no other known compound.

It is homologous, as far as its empirical formula is concerned, with common camphor, but has different properties.

Analysis III, above, was made two or three months later than the other two, after the substance had been standing in a test tube corked, with occasional removal of the cork. It will be noticed that oxidation is very slow, if it takes place at all, though a faint tint of yellow seemed to indicate such action. Experiments have been commenced with the object of determining the nature of these substances and their chemical constitution, if possible, and I intend to subject the reactions and derivatives of these interesting compounds to an extended investigation. As other duties, however, entirely occupy me at present, I have been compelled to postpone further investigation on this subject for some months. I therefore make this preliminary report and take the opportunity to reserve the ground for future work.—*Am. Chem. Jour.*, April, 1880.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

Glycerin Cement was first made by Hirzel, who recommended it as an excellent cement for vessels containing benzol, volatile oils, etc. Prof. Th. Morawski, who experimented with many different formulas, found that the best cement is obtained by adding 5 cc. of glycerin to 50 grams of litharge; if more glycerin is used, the mass hardens more slowly and does not become as firm. By mixing 5 volumes of glycerin with 2 volumes of water and using 6 cc. of this mixture with 50 grams litharge a cement is obtained which becomes quite hard in ten minutes, and harder in two hours than glycerin cement made by any other formula, but it is not as durable and firm after standing two days as that made by the first formula.—*Pharm. Centralb.*, March 11, 1880, p. 90., from *Dingl. Journ.*

Lametta, which, according to Skalmeyt, consists of 98.93 per cent. of copper and 1.07 per cent. of silver, is used in China for manufacturing metallic threads used in garments, and in Germany for ornamenting Christmas trees.—*Ztschr. d. Allg. Oest. Apoth. Ver.*, March 10, 1880, p. 127, from *Gewerbebl. f. d. Grossherz. Hessen.*

Unguentum contra favum capitis is a salicylic pomade, recommended by Hager as an innocent cure of sore head of children and as an exterminator and preventive of vermin. It is made by reducing salicylic acid 10.5 grams and borax 3.3 to a fine powder, adding

yellow wax 50·0 and lard 250·0 grams, previously melted together and colored red with alkanet, balsam of Peru 10 grams, oil of bergamot 50 drops, oil star anise 20 drops, and rose water 30·0, and stirring until the ointment solidifies.—*Pharm. Centralb.*, March 11, 1880, p. 90.

Glycerin and Sodium Bicarbonate for Burns.—Sodium bicarbonate has been used extensively and very successfully lately as an application to burns by spreading a layer of the powdered salt over the burnt part and surrounding it with a moistened strip of linen; when thus used on fresh burns the pain is relieved immediately and blisters never form. Dr. Th. Koller recently tried repeated glycerin applications for burns, and reports that he found it not only equal, but even far superior to sodium bicarbonate for relieving the burning pain and preventing the formation of blisters, it at the same time leaving the skin soft while the sodium bicarbonate is apt to have the opposite effect. He applies the concentrated, syrupy, perfectly clear glycerin to the burns with the hand with but very slight pressure.—*Pharm. Ztg.*, March 6, 1880, p. 140, from *Neue Erf.*

Red Carbohc Acid.—The red color appearing in previously entirely colorless pure carbohc acid is considered by Hager to be caused by the ammonium nitrite existing in the atmospheric air. Acid filled into bottles while in a melted state in an atmosphere free from ammonia, and afterwards kept in air-tight bottles, will remain colorless.—*Pharm. Post*, March 16, 1880, p. 108, from *Pharm. Centralb.*

Separation of Quinia from Strychnia.—Dwars dissolved 5 grams of citrate of iron, quinia and strychnia in a little water supersaturated with ammonia, shook with chloroform, allowed the chloroform to evaporate, dried the residue at 110°C., and obtained 0·81 gram = 16·2 per cent. of alkaloids. The residue was dissolved in warm water, adding sufficient sulphuric acid to obtain a neutral solution, to which ammonium oxalate was added in excess. On the following day the quinia oxalate was collected, washed, and dried at 100°C., when it weighed 0·704 gram = 0·618 quinia. The filtrate and wash-water were shaken with ammonia and chloroform. After evaporating 0·1775 gram amorphous alkaloid, strychnia and traces of crystallized quinia remained, which were treated repeatedly with pure ether, yielding ultimately 0·021 gram of pure strychnia.—*Pharm. Ztschr. f. Russl.*, Feb. 1, 1880, p. 76.

Quinia bimuriate is well adapted for hypodermic injections, because it is soluble in water in every proportion, and was warmly recom-

mended several years ago by Galignani, whose statements were contradicted by many Italian physicians, who erroneously used the ordinary quinia muriate. Dr. Vitali now explains the difference between the two salts, and again recommends the bimuriate, which he prepares by mutual decomposition between quinia bisulphate and barium chloride, obtaining it in not crystalline yellowish-white masses, which afford a snow-white powder. The salt thus obtained contains 81.61 per cent. of quinia, which is more than that contained in the officinal sulphate and in bisulphate, the former containing 74.33 and the latter 59.14 per cent. Quinia bimuriate is prepared most readily by accurately precipitating a solution of quinia bisulphate with barium chloride, filtering and evaporating to dryness.—*Pharm. Ztg.*, March 6, 1880, p. 140, from *Bullettino Farmaceutico di Milano*.

The Chemical Constitution of Picrotoxin, the poisonous constituent of *Cocculus indicus*, was again studied by L. Barth and M. Kretschy, who found that the picrotoxin is a mixture of three constituents, the two principal ones of which differ in the percentage of C to the extent of about 4 per cent., and exist in varying relative proportion, which explains the different results obtained by analytical chemists. The constituent for which the name of *picrotoxin* is retained contains the most C, has the formula $C_{15}H_{16}O_6$, and is exceedingly bitter and very poisonous. The second constituent has the formula $C_{25}H_{30}O_{12}$, is very bitter, not poisonous, and is denominated *picrotin*. But a very small percentage (about 2 per cent.) of the third constituent is present; it is not bitter, not poisonous, and is called *anamirtin* by the authors.—*Pharm. Centralb.*, March 11, 1880, p. 91, from *Chem. Centralbl.*, from *Wien. Anz.*

Quaiac Resin as a Reagent for Copper.—Schoenbein found that copper salts in the presence of cyanides yield a blue coloration with quaiac, and Purgotti discovered that the ferrocyanides, nitroprussides, sulphocyanates, cyanates, and also the alkaline chlorides, yield the same reaction as the cyanides, and utilized this discovery as a test for copper, proceeding as follows: The solution, which ought not to contain any substances which (like ferric salts) yield a blue coloration with quaiac, is mixed with the solution of an alkaline chloride, and is slowly poured into a test-tube containing an alcoholic solution of quaiac. If but the slightest trace of copper is present a blue coloration is visible at the point of contact of the two liquids, while, in case much copper is present, the whole mixture turns blue when shaken. Thus a distinct reac-

tion was obtained with 0.001 milligram $\text{CuSO}_4 + 5\text{H}_2\text{O}$ in 1 decigram of water.—*Ztschr. d. Allg. Oest. Apoth. Ver.*, March 10, 1880, p. 120, from *Gaz. Chim. Ital.*

Chloral hydrate, according to Dr. A. Belohoubek, should be entirely volatile, soluble in alcohol, ether and water, melt at 46°C ., boil at 96° to 98° , and, when heated with potassa lye, should liberate chloroform, readily recognized by its odor. Another good test is that published by F. Ogston, which consists in adding to a moderately strong chloral hydrate solution yellow ammonium sulphide, when the colorless liquid soon turns orange-yellow or almost red. After standing for some time it becomes cloudy, liberating a gas of a very unpleasant odor. Chloroform, benzol, naphtha, formic acid, etc., do not yield a similar reaction, but croton chloral gives the same reaction with ammonium sulphide.—*Pharm. Ztschr. f. Russl.*, Feb. 1, 1880, p. 78, from *Rundschau f. Pharm. Chem.*

"Curry Powder," also known in some districts of Germany as *Ragout Powder*, is a coarse brownish-yellow powder, having a strong aromatic odor and taste, and is almost altogether imported from England, where it was introduced from India. The following two formulas for its preparation are highly recommended, the first yielding the so-called **"Bengal Curry,"** which is preferred in East India, while the second is used very extensively in England, and is exported to Germany:

I.		II.	
R	Piperis nigri, 40.0	R	Piperis nigri, 20.0
	Capsici, 10.0		Capsici, 10.0
	Coriandri, 100.0		Coriandri, 80.0
	Fœnu Græci.		Carvi, 20.0
	Piperis albi.		Piperis albi, 10.0
	Carvi, aa 25.0		Curcumæ, 50.0
	Curcumæ, 80.0		Zingiberis.
	Zingiberis, 20.0		Cinnamomi, aa 2.0
	M. f. pulvis grossus.		Alli sativi, 10.0
			M. f. pulvis grossus.

—*Pharm. Centralh.*, March 11, 1880, p. 91.

"Bacilla cuneiformia nasalia," **"Cereoli nasales,"** or **"Nasal Bougies"** are used in the treatment of nasal diseases. They are 8 to 10 cm. in length, about 6 or 8 mm. in thickness at the base, tapering to a point 3 or 4 mm. thick. The following recipes give an idea of their usual composition and the method of preparing them:

1. *Bacilla cuneiformia carbolica*, *carbolic nasal bougies*, used in the

treatment of excessive or offensive nasal catarrh, are prepared by dissolving in a water bath white gelatin 55.0, in glycerin 30.0, and distilled water 20.0, adding pure carbolic acid 0.2, and pouring the mixture into 15 moulds made of glass or waxed (paraffin) paper. X

2. *Bacilla cuneiformia tannica*, or tannin nasal bougies are moistened before introducing them into the nose and are made by mixing tannic acid 2.0, tragacanth 6.5, and marshmallow root 2.0, adding glycerin 6.0, and water 3.5, and making into tapering bougies.

3. *Bacilla cuneiformia zincica* consist of white gelatin 60.0, glycerin 40.0, distilled water 20.0, and zinc sulphate 0.5, made into 20 bougies. —*Pharm. Centralb.*, March 11, 1880, p. 87.

Condensed Goat Milk, made by Sigmond Bros. at Klausenburg, was analyzed by Dr. R. Godeffroy, who found it to contain in 100 parts: Water, 20.98; milksugar, 15.72; canesugar, 26.71; fatty substances (extracted by ether), 16.95; casein (albuminous substance), 17.20; milksalts (percentage of ashes), 2.64 parts. —*Ztschr. d. Allg. Oest. Apoth. Ver.*, March 10, 1880, p. 118.

Hager's Pilulæ antiphlogistigæ (also called Acid Cinchona Alkaloid Pills, Anti-inflammation Pills, Catarrh Pills), are said to cure bronchial catarrh, cold in the head, coughs, etc., usually in the course of a few hours. They are made by the following formula:

R	Quinidiæ sulphatis, cinchonidiæ sulphatis,	ana 5.0
	Tragacanthæ,	7.0
	Radiciæ althææ, radiciæ gentianæ,	ana 3.0
	Ligni santali rubri,	1.0
	Glycerinæ, acidi hydrochlorici,	ana 7.5
	M. f. pil. 200.	

Dust with powdered cinnamon and dispense in a bottle. Dose: Take 6 pills immediately when the first symptoms of bronchial catarrh, etc., appear; then 2 pills every hour and 5 pills at bed-time, followed by 3 pills every 3 hours during the next day and 6 pills before going to bed. —*Pharm. Centralb.*, March 18, 1880, p. 93.

Salicylic Acid and Powdered Charcoal are very objectionable ingredients in tooth powders and mouth washes, in Dr. W. Suerssen's opinion, who claims that the charcoal, even when finely powdered, will polish off the enamel of the teeth mechanically, and besides will settle permanently in the gums, forming blackish-blue rings, while the salicylic acid, even in very dilute solution (1:1000) attacks the teeth, and ought, therefore, only to be used in the treatment of various morbid conditions of the mouth. The author considers precipitated chalk

the best tooth powder and alcohol the best addition to a mouth wash, and states that both may be perfumed if desired.—*Ibid.*, March 25, 1880, p. 108.

“*Succus Citri Depuratus*” is the name suggested by Hager for the purified lemon juice prepared by Fleischer & Co., who, by introducing it into the German market, according to Hager, supplied a long-felt demand for a substitute for the commercial, cloudy, Italian juice, which almost always contains acetic acid. Fleischer’s German juice is prepared by purifying and clarifying fresh lemon juice, is either colorless or slightly yellowish, perfectly clear, contains 9.3 to 9.4 per cent. acid, and keeps for weeks in the cold season of the year, even in partially filled bottles, and probably equally as long in the hot season if kept in full and well-corked bottles.—*Ibid.*, p. 105.

Preparation of Potassium Cantharidate and Cantharidin by Dialysis.—E. Dieterich recommends digesting for 5 hours, and boiling slightly for 15 minutes, 1,000 grams of coarsely-powdered cantharides, 50 grams potassium hydrate, and 6,000 grams of water. The cooled liquid is strained and expressed, and the residue again treated as before, adding but 20 grams potassium hydrate. The liquid is filtered and the filtrate transferred to three dialyzers, about 60 cm. in diameter, which are suspended in correspondingly large, shallow, porcelain-lined, iron dishes. In these dialyzers the filtrate is digested for 5 to 6 days, the water being replaced as it evaporates. After neutralizing the dialyzed brownish liquid with dilute sulphuric acid, powdered charcoal is added, the whole evaporated to dryness, the dry residue mixed with a little barium carbonate, and then boiled with acetic ether; the ethereal liquid is distilled, the remaining cantharidin washed with alcohol and recrystallized from acetic ether, when it is obtained in brilliant white crystals. Thus, the author obtained a yield never below 2.80 grams, while the usual method never yields over 2.30 gram.—*Ibid.*, March 11, 1880, p. 87.

Detection of Potassium Iodide in Potassium Bromide.—Hager recommends powdering a number of crystals, dissolving 0.1 gram of this powder in 10 or 12 cc. of 10 per cent. ammonia water, adding 1 drop of silver nitrate solution, and shaking, when a clear solution will be obtained, unless iodide of silver is present, a small percentage of which will render the liquid decidedly cloudy. This test is sufficiently accurate for indicating the presence of an *objectionable* percentage of potassium iodide, but will not answer for detecting very minute traces.

Potassium chloride in potassium bromide is detected, by the same author, by dissolving 0.1 gram powdered potassium bromide in 2 or 3 cc. of water, mixing well with a solution of 0.16 gram of silver nitrate in 3 or 4 cc. of water, adding 10 or 12 cc. of solution of ammonium carbonate, shaking frequently for about 10 minutes, and filtering, returning the filtrate to the filter until it passes entirely clear. To 3 or 4 cc. of the clear filtrate nitric acid is then added, drop by drop, until neutralized, when, in case potassium bromide alone was present, the liquid remains clear, while in the presence of silver chloride it will be opalescent or cloudy, according to the percentage of chloride present.

Hydrochloric acid in hydrobromic acid may be detected in a similar manner, using 2 or 3 drops of the acid, 7 to 10 drops of solution of silver nitrate, adding about 10 cc. of solution of ammonium carbonate, shaking, macerating, filtering and supersaturating with nitric acid.—*Ibid.*, p. 85-87.

Arsenic in hydrochloric acid is detected by Hager's modification of Bettendorf's method by dropping the acid in very small drops on thick tin-foil, setting aside, and exposing to a heat of from 50° to 90°C. Concentrated acid and acid diluted with an equal bulk of water, and containing $\frac{1}{50000}$ or $\frac{1}{100000}$ arsenic, immediately turn brown on the tin-foil; when diluted with 8 or 10 times its bulk of water the reaction is considerably slower. A very dilute acid, containing $\frac{1}{200000}$ arsenic, dropped on tin-foil in small drops, and placed in a lukewarm place, yielded steel-colored spots. The test is not reliable for an acid containing but $\frac{1}{300000}$ arsenic.—*Ibid.*, March 25, 1880, p. 101.

VARIETIES.

Duboisia Sulphate.—S. D. Risley, M.D., Lecturer on Ophthalmoscopy in the University of Pennsylvania, in an interesting article in the "Amer. Jour. Med. Sci.," April, 1880, "On the relative value of the sulphates of atropia and of duboisia in ophthalmic practice," states that the following conclusions seem justifiable:

1. That in solutions not stronger than two grains to the ounce duboisia is free from danger.
2. That the two-grain solution of Duboisia sulphate more rapidly paralyzes the ciliary muscle than a four-grain solution of atropia sulphate.
3. That the duration of its effect is less than half that of atropia.
4. That the preparations now in the market are more liable to irritate the conjunctiva than neutral solutions of the sulphate of atropia.
5. That in the treatment of inflammations of the eye duboisia is quite as useful as atropia, and therefore may be used as a substitute.

Pilocarpina.—Two remarkable observations have been published abroad during the past year relative to the use of pilocarpina. In one case a patient of Dr. Schmitz, of Cologne, previously completely bald, after three injections of pilocarpina began to have a luxuriant growth of hair, and at the end of four months had a dense covering for the head, part black in color, part grizzled and part white. The other was reported at the Ophthalmological Congress at Amsterdam last September, by Dr. Coppez, of Brussels, and published in the "Annales d'Oculistique," September and October, 1879. The patient, suffering from serious iritis with trouble in the vitreous body, received three injections of chloralhydrate of pilocarpina, and his hair, previously white, took on its original color and texture. These are the only instances in which pilocarpina may be presumed to have had this effect, and the question arises whether it was an accidental coincidence or the result of the drug.—*Chicago Med. Gaz.*, March 20, 1880.

Chloral in the Vomiting of Pregnancy.—Dr. Herzberg, of the Berlin Charité ("Berl. Klin. Woch."), has found chloral of great utility in vomiting from any cause, and in some affections, as gastralgia, rapidly effective. In this paper he wishes to call attention to its great efficacy in the vomiting of the early months of pregnancy. He always uses this formula: Chloral, $1\frac{1}{2}$; water, 100, and syrup of orange peel, 20 parts, giving a spoonful every two hours. A few spoonfuls suffice to stop the vomiting for a long time. If after some days it returns again, a recurrence to the remedy entirely removes the evil.—*Louisville Med. News*, March 13, 1880.

Benzoate of Sodium in Diphtheria.—Dr. Letzerich has successfully treated, with benzoate of sodium, 27 cases of diphtheria which came under his care during an epidemic of the disease in Berlin. Of these cases eight were severe, accompanied by high fever, delirium, retention of the urine and feces, existing often before the extensive local affection had made its appearance. In the blood there was found numerous bacteria and plasma corpuscles, from which, by cultivation in veal broth, very large colonies of micrococci became developed. The dose of sodium benzoate for children and adults is to be regulated by the weight of the body. The formula for infants under one year old is

R Sodii benzoat. pur.,	.	.	.	.	.	.	.	5'0
Aquæ destillat.,	.	.	.	.	.	.	.	.
Aquæ menth. pip.,	.	.	.	.	.	.	aa	40'0
Syrup. cort. aurant.,	.	.	.	.	.	.	.	10'0

Half teaspoonful every hour.

The dose for children between one and three years of age is given at 7 to 8 grams in the course of a day; for children between three and seven years, 8 to 10 grams, over seven years old 10 to 15 grams, to be taken daily; no unpleasant effects have been observed even in young infants. The diphtheric membrane was sprinkled with the benzoate of sodium in powder applied through a glass tube or quill. There is no slough formed, and thereby the danger is averted of its acting as a firm covering under which an energetic development and growth of the organism can take place.

The insufflation was made every three hours in severe cases; in the mild forms two or three times daily. The author also recommends this remedy in gastric or intestinal catarrh, particularly of infants, and states that at times the results are surprising in these latter cases. He firmly believes in the statement of Klebs, that it is to be recommended in all diseases which originate by infection.—*Boston Med. and Surg. Journ.*, from *Berlin. Klin. Wochens.*

Iodized Phenol.—Battey's formula for iodized phenol, iodine cryst. $\frac{3}{4}$ ss, acid carbolic $\frac{3}{4}$ i, is highly recommended by Dr. J. H. Bellamy in other than uterine affections. He has found it very useful in certain skin diseases, particularly those attended with itching. In the eczema marginatum it works very promptly. It is to be diluted generally with equal parts of glycerin, and applied twice a day.—*N. Carolina Med. Jour.*, from *Toledo Med. and Surg. Jour.*, March, 1880.

Cedron as a Substitute for Quinia.—Admiral Lapellin draws attention to a bean which is used by the inhabitants of Central America in the treatment of the cold fever, and which is said to be a good substitute for quinia. Dr. Coignard, who obtained the remedy in Puerto Arenas, Costa Rica, obtained favorable results with it, and Drs. St. Père and Quesnel found it even more powerful than sulphate of quinia. The bean is cut into bits as large as a pea, several of which are given in the interval between the paroxysms. This almond or bean is obtained from the *Simaruba ferruginea*.—*Med. Chir. Rundschau*, Nov., 1879, from *The Med. Record*, from *Nashville Journ. of Med. and Surg.*, April, 1880.

Iodoform Paste.—The "Medical Gazette" advises the following combination for the purpose of disguising the odor of the drug: R Iodoformi $\frac{3}{4}$ i, Mucil. cum glycerina gtt. xx, Ol. menth. pip. (seu neroli, seu caryoph.) gtt. i. M.—*Proceedings of the Med. Soc. of the County of Kings, New York*, April.

Tartrate of Morphia.—The new preparation of neutral tartrate of morphia is a useful adjunct to our therapeutics. Being very soluble it passes quickly out of the system, and gives less of the unpleasant after effects than either the muriate or acetate. Its great solubility makes it particularly advantageous for subcutaneous injection. It gives little smarting or irritation when thus administered, and the solution never clogs the finest needles.—*The Med. Press and Circular*, London, March 10th, 1880.

Improved Caustic Sticks.—Dr. Sawostizki called the attention of the Moscow Surgical Society to an improvement in the preparation of sticks of nitrate of silver. It consists in melting together five parts of nitrate of silver with one part of nitrate of lead, forming an *argentum plumbo-nitricum*. Sticks formed of this are preferable

to those of the ordinary nitrate, as they are not easily broken and can be pointed just like a lead pencil.—*Ibid.*, April 7th, 1880.

Ergot in Pharyngitis.—In chronic pharyngitis, where the blood-vessels of the pharynx are enlarged and tortuous and the secretion moderate, the following is recommended :

R	Ergotin,	.	.	.	.	.	.	gr. xx.
	Tinct. iodine,	.	.	.	.	.	.	fl. ʒi.
	Glycerin,	.	.	.	.	.	.	fl. ʒi. M.

Sig. Apply to the pharynx freely twice daily with a camel's-hair brush:—*The Ohio Med. Reporter*, April, 1880.

External use of Atropia for the Pain of Cancers.—M. Anger uses, with great success, compresses saturated with a neutral solution of sulphate of atropia, and applied over the seat of pain. The compress is covered with oiled taffeta, or better with sheets of gutta percha, to prevent evaporation, and renewed three or four times a day.

The strength of the solution employed is (grs. xv) 1 gram of the sulphate to (Oii) 1,000 grams of water. He has never seen signs of absorption of the medicine, such as dilatation of the pupil, dryness of the throat, etc. This action is not denied, but it is presumable that the action is local, contraction of the vessels, diminution of the sensibility. The facility of applying it and the cleanness of this method give marked advantages over hypodermic injections and ointments. At the same time the marked relief observed in the terrible pains of cancer seem to recommend its use.—*Chicago Med. Journ. and Exam.*, April, 1880.

Unalterable Cold Cream.—The "Repertoire de Pharmacie" gives the following formula for a cold cream that possesses the property of not becoming rancid :

Quince mucilage,	.	.	.	(ʒiiss)	40 grams
Almond soap,	.	.	.	(gr. xv)	1
Stearic acid,	.	.	.	(ʒiiss)	10
Glycerin,	.	.	.	(ʒss)	2

—*Ibid.*

Cultivation of the Cinchona Tree in California.—The "Pacific Medical and Surgical Journal" writes on the cinchona tree as follows : "There is no subject on which our legislature could act with so much benefit to the Pacific coast as in the adoption of measures for introducing the growth of the cinchona tree. We are more and more convinced, from all we read of its introduction and cultivation elsewhere, that there are many sections of country in our State in which it would flourish and prove a source of bountiful revenue. The latest evidence of this which we have met with is in a communication to the Department of Agriculture at Washington from Willis Weaver, written at Bogota, South America. Mr. Weaver has

studied the habits and history of the tree, which, he says, seeks a soil inclining to dryness, but well watered during a portion of the year. We copy from his letter a few passages which may be found in the "Scientific American" for February 28th:

"The coasts of Northern California and Oregon would fulfill the conditions as to moisture; the slopes of the mountains would probably furnish hilly ground very similar to that occupied by the tree in its native habitat; while I believe that the temperature would admit of its cultivation even north of the mouth of the Columbia. It is also uncertain as to how far any undue dryness of the atmosphere may be overcome by irrigation. The surprising results already attained in the cultivation of the trees prepare us to expect further advances, and this may be one of them as naturally as anything else.

"It is well known that the barks produced under cultivation are much superior to the natural bark, as the process of mossing the tree causes a remarkable development of the alkaloids in which their virtue consists; also, that the cultivated trees are not destroyed. A strip is taken off reaching the length of the trunk, and one-third its circumference. The wound is then dressed with straw matting, and kept wet until the bark forms anew. The next year another strip is taken, and so on indefinitely. I am told that the harvest begins when the tree is five years old, but am not in a position to verify the statement.

"I have calculated roughly, according to the prices of land and labor here, that a plantation of a hundred acres might be put in at less than \$1,000 an acre, covering all outlay, or, say \$1,500 to cover interest and all contingencies. A yield of \$8,000 an acre has been reported from Indian plantations.'"—*The Boston Med. and Surg. Jour.*, April 29, 1880.

The Action and Uses of Hyoscyamia.—Mr. Engledue Prideaux, assistant medical officer at the Friends' Retreat, near York, presents in the "Lancet," October 11, 1879, an elaborate paper based upon very extensive experience in the use of the drug, of which the following, taken from the "Medical News and Abstract," Jan., 1880, is a summary:

1. That in most cases of mania, or where there exists great excitement of an aggressive and destructive character, or rapidity of movement and speech, the use of the drug is the most effectual and rapid means of exercising that form of restraint which has been termed "chemical restraint."

2. That in cases of acute mania it will produce sleep and quietude when all other drugs have failed, and is one of the most rapid and reliable narcotics we possess.

3. That in the treatment of the epileptic status in epileptic mania, it diminishes the number, frequency and severity of the attacks, especially if its administration be extended over some time.

4. That in delusional insanity, especially the mania of suspicion and other forms of mania where the delusions are varying and changeable, it has a decided action in producing such an altered condition of the cerebral status that a condition which has been termed "physiological mania" results, and this so eclipses the former delusions and hallucinations that they are forgotten, and the mind becomes clear; while if the subjection to the influence of the drug be continued, it ultimately leads, under

favorable circumstances, to a permanent condition of quiescence and restoration to a healthy state of mind.

5. That in chronic dementia, associated with destructive tendencies, bad habits, and sleeplessness, the condition of the patient much improves after a continued course of small doses of the drug.

The disadvantages that have occurred in its use, and which have to be guarded against, are: the dryness of the tongue and pharynx that occurs, especially after a prolonged administration. This has been thought to contra-indicate its use in cases of artificial feeding, but provided the tube be dipped into an oily liquid before passing, I have not found it any inconvenience. The attacks of vomiting that have occurred in some cases after an administration of some weeks, necessarily lead to a discontinuance of the drug. Vomiting occasionally occurs after one dose, even a small one, and in two cases mentioned by Dr. Lawson, hæmatemesis took place. Where rapid and sudden action of the drug is feared in feeble cases, it is better to administer it with the food.—*Chicago Med. Gazet.*, April 5th, 1880.

Solid, Crystallized, Fuming Sulphuric Acid, containing frequently as much as 98 per cent. anhydride, is beginning to be used extensively in the manufacture of alizarin, eosin, etc., and is at present not only manufactured at Bohemia, as formerly, but also in Freiberg, Ludwigshafen, Mannheim, Schlebusch and London. According to Prof. Stoelzel, organic substances (wood, saw-dust, etc.), brought into contact with this acid, are reduced to charcoal, sufficient heat being sometimes generated to cause ignition. If mixed with one-fourth its bulk of water, the acid will immediately transform the latter into vapor, the transformation being accompanied by a generation of light and an explosion. The acid will also explode when heated in closed bottles to 50°C.—*Pharm. Centralt.*, Dec. 16, 1879, p. 470, from *Handelsbl. d. Chem. Ztg.*

An Innocent Green Coloring Substance, for coloring confectionery, candy, etc., can be extracted, according to Zech, from coffee beans by reducing them to powder, extracting the oil with ether, allowing them to dry, and mixing with sufficient white of egg to make a kind of gruel, which is then exposed to the air for a few days, when an emerald-green color is produced. Another and simpler method consists in pouring water on the reduced beans, previously deprived of their oil, and extracting the coloring matter by washing in (?) alcohol.—*Pharm. Ztg.*, Jan. 3, 1880, p. 3, from *Gemeinnuetz. Wochenschr.*

Preparations of Pepsin and Iron.—At a recent meeting of the Paris Academy of Sciences, Vulpian, Chatin, Personne and Peter energetically attacked all pharmaceutical specialties, and particularly all preparations of pepsin and iron, which in their opinion scarcely ever contain what their manufacturers claim, and in nine cases out of ten are entirely inefficient. Vulpian particularly found fault with the different

pepsins, diastases and pancreatins of the (French) market, and still more so with the wines and elixirs made from these, in which the alcohol almost entirely counteracted the medicinal effect of these principles. Chatin, the director of the School of Pharmacy, suggested to banish all proprietary medicines from drug stores, and advised physicians not to prescribe them under any condition. Similar views were expressed by Vulpian and Prof. Peter. Personne referred to iron specialties, and particularly to Bravais' dialyzed iron, which he considered impure and entirely insoluble in the stomach and therefore of no value, and Prof. Berthelot stated that it should be employed in every case where the use of an absolutely inert iron preparation is desired.—*Pharm. Post*, Dec. 16, 1879, p. 374.

White Furs are Dyed by Sieglitz & Co. by applying to the ends of the hair a mixture of 10 parts gum arabic, 5 parts lead acetate, 10 parts fatty white clay, 10 parts basic copper acetate and water, drying, immersing into a decoction of litharge with milk of lime, treating with diluted ammonium sulphide, and finally with an extract of galls. The ends remain white, while the lower portion of the hair is dyed brown.—*Chem. Centralbl.*, Dec. 17, 1879, p. 816.

Artificial Wool is made from flax, jute or hemp waste, or from rags of these materials, by M. Neumann's patented process, by first treating these substances with soda and soap, at 100° (3 kg. soda and 1 kg. soap to 600 liters water), then transferring them to a lukewarm bath containing calcium chloride and (or?) magnesium sulphate, adding hydrochloric acid, and finally treating them for a short period with a 0.5 per cent. solution of sulphurous acid, and washing them.—*Ber. d. Deutsch. Chem. Ges.*, xii (1879), p. 2272.

Benzoic Acid is Prepared from Benzoin by R. v. Wagner by dissolving the resin by digesting with 3 to 4 parts strong acetic acid, decanting the brown solution, pouring into 4 parts boiling water and removing the grayish-brown resin, which separates by filtration, when the greater portion of the benzoic acid will crystallize from the filtrate on cooling, while another yield is obtained on evaporating the liquid, previously partially saturated with calcium hydrate. The benzoic acid, separated from the acetic acid solution, possesses, after drying and melting, a pleasant odor resembling storax, and can be used for aromatizing and for preparing fumigating powder, etc. The solubility of benzoin in acetic acid might also be advantageously made use of for preparing disinfecting and fumigating essences. Balsam tolu, balsam Peru and storax likewise dissolve in acetic acid.—*Pharm. Ztg.*, Jan. 7, 1880, p. 11, from *Pol. Notizbl.*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, May 18th, 1880.

Mr. Alonzo Robbins was called to the chair, and the minutes of last meeting were read and approved.

Donations to the library were called for, and the Registrar exhibited twelve volumes of the "American Journal of Pharmacy," almost all of them quite scarce, presented to the College by our fellow member Robert Shoemaker. This enables the Librarian to report that the second set of the JOURNAL for the library has now been completed.

The thanks of the College was directed to be returned to Mr. Shoemaker for his most timely donation.

A paper upon Koumys, by G. L. Truckenmiller, Ph. G., was read by the Registrar. A paper upon the same subject was also read by our fellow member Dr. L. Wolff. Both papers were referred to the Publication Committee.

Prof. Remington inquired as to the manner of making ointments and cerates, as practiced by the members present; the Pharmacopœia directs that all of them should be stirred till cool. Prof. Remington stated that he had tried the opposite plan of melting the materials with the least possible heat, straining into a proper recipient and permitting it to cool gradually without any stirring or any disturbance whatever. His experience was in favor of this plan.

A formula for iodized oil of bitter almonds was asked for by a member. The formula was reported, iodine gr. xx, oil of bitter almonds fʒi—M., and permitting it to stand until it dissolves, which is only effected after considerable lapse of time. Professor Remington has also experimented with oil of sassafras instead of oil of bitter almonds, and has observed that is a very much better solvent for iodine than the oil of bitter almonds.

Prof. Remington called attention to the approaching meeting of the Pennsylvania Pharmaceutical Association, which will take place at Allentown in the early part of June, and recommending the trade here to connect themselves in membership.

There being no further business, on motion adjourned.

T. S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

The Pharmaceutical Society and the Braunhart Prescription Bill.—At a meeting of the California Pharmaceutical Society, held March 17th, for the purpose of endorsing the action of E. Painter and W. M. Searby, in their efforts to secure the passage of the Braunhart bill, the following was unanimously adopted:

WHEREAS, A special committee was appointed by this Society to devise means to secure the passage of the Braunhart bill for the suppression of percentages paid by apothecaries to physicians on their prescriptions, and

WHEREAS, Two of our members have taken an active part in securing the bill's

passage, thereby incurring the displeasure of certain physicians, who now seek to injure the business of these gentlemen; therefore be it

Resolved, By this Society, that we regard the Braunhart bill as a just one, and likely to deter unprincipled apothecaries from continuing the nefarious practice.

Resolved, That we heartily endorse each and every action of Messrs. E. Painter and W. M. Searby, with whom we are anxious to share the odium (?) sought to be attached to them by those who we have reason to believe profit by the practice we aim to suppress.

Cincinnati College of Pharmacy.—The monthly meeting was held April 14th, with a large attendance. A fine collection of rare drugs (about 40 different specimens) was received from Messrs. James G. Steele & Co., of San Francisco, Cal., in acknowledgment of which the sincere thanks of the College were offered. Mr. J. U. Lloyd showed a specimen of adulterated santolin, containing 85 per cent. boric acid and 15 per cent. santolin. After discussing at some length the revision of the Pharmacopœia the meeting adjourned.

EDITORIAL DEPARTMENT.

Decennial National Convention for Revising the Pharmacopœia.—*Wednesday, May 5th. First Day. First Session.*—The Sixth Decennial Convention for the Revision of the Pharmacopœia of the United States met in the National Medical College, H street, between Thirteenth and Fourteenth streets, N. W., Washington, D. C., May 5th, 1880.

The Convention was called to order by the only surviving officer of the last convention, Dr. James E. Morgan, of Washington, at 12 M., who, on motion of Dr. R. E. Rogers, of Philadelphia, was elected temporary Chairman, and Dr. D. W. Prentiss, of Washington, was elected temporary Secretary.

Dr. Morgan, upon taking the chair, referred in a feeling manner to the fact that he was the only surviving officer left, thanked the Convention for the honor conferred upon him, and trusted that the proceedings would be characterized by harmony, and the important business be successfully accomplished.

COMMITTEE ON CREDENTIALS.

The first business in order being the appointment of a Committee on Credentials, the Chairman selected Dr. W. S. W. Ruschenberger, A. B. Taylor and W. S. Thompson as this committee.

After a recess of fifteen minutes the committee reported that they had received credentials from the following bodies: Massachusetts College of Pharmacy, Philadelphia College of Pharmacy, Louisville College of Pharmacy, Maryland College of Pharmacy, Medical Society of the District of Columbia, National Medical College Columbian University; Medical Department of the University of Georgetown, D. C.; National College of Pharmacy, Washington, D. C.; Medical Department University of Pennsylvania, Massachusetts Medical Society, Bellevue Hospital Medical College, College of Pharmacy City of New York, College of Physi-

cians and Surgeons Medical Department of Columbia College; Dartmouth Medical College, Hanover, N. H.; Connecticut Medical Society, Rush Medical College, Chicago; Philadelphia County Medical Society, State University of Iowa Medical Department, Iowa State Medical Society, St. Louis College of Pharmacy, University of Michigan School of Pharmacy; College of Physicians, Philadelphia; Medical Department of the U. S. Army, University of the City of New York Medical Department, Medical Department of Medicine and Surgery of Michigan University, Chicago College of Pharmacy, Cincinnati College of Pharmacy, Woman's Medical College of Philadelphia, Medical College of Indiana, Medical Society of the State of New York, College of Medicine of Syracuse University, Medical Department of U. S. Navy, U. S. Marine Hospital Service; Miami Medical College, Cincinnati; Pennsylvania College of Pharmacy, Missouri Medical College, St. Louis; College of Physicians and Surgeons of the City of New York; Medical Department of Howard University, Washington, D. C.; University of Albany, N. Y.; Jefferson Medical College, Philadelphia; New York Academy of Medicine; Medical and Chirurgical Faculty of Maryland, Baltimore; University of Maryland, Women's Medical College, New York; North Carolina State Medical Association.

Objection was made to admitting the delegates from some of the bodies, on the ground that they were not strictly entitled to seats under the call of the Convention, which embraced "incorporated State Medical Societies, incorporated Medical Colleges, incorporated Colleges of Physicians and Surgeons, and incorporated Colleges of Pharmacy."

Dr. Busey, of Washington, moved to admit delegates from Medical Departments of the Army and Navy and from the Marine Hospital Service; also those from the Medical Society of the District of Columbia. Carried.

The motion by Prof. R. E. Rogers to admit the delegates from Philadelphia County Medical Society gave rise to considerable discussion.

Prof. Remington moved that the Chairman of the delegation from the Philadelphia County Medical Society, Dr. Henry H. Smith, be invited to state the circumstances which led to the appointment of these delegates. Dr. Smith explained that the Society had been invited to send delegates by Dr. Morgan, the only remaining officer of the previous convention, that they had taken considerable interest in the work of revising the Pharmacopœia, had prepared a report upon the revision, which had occupied them considerable time, and that they had not anticipated any objection to the admission of their delegation, as similar bodies had been received at previous conventions without challenge.

After hearing the statement of Dr. Smith the Convention decided to admit the delegation, and Prof. Rogers' motion was therefore carried.

COMMITTEE ON NOMINATION.

Mr. Thomas Doliber, of Boston, moved that a committee on nominations be appointed, consisting of one member from each body represented in the Convention, which was carried, whereupon the Secretary called upon each of the various delegations to name one of their number to serve upon this committee, when the following were appointed: S. A. D. Sheppard, A. B. Taylor, C. Louis Diehl, Jos. Roberts,

Dr. Antisell, Dr. W. W. Johnson, Dr. S. C. Busey, R. B. Ferguson, Dr. H. C. Wood, Dr. E. S. Wood, Dr. F. A. Castle, Chas. Rice, Dr. E. Curtis, Dr. H. M. Field, Dr. H. H. Smith, W. H. Crawford, H. B. Parsons, Dr. I. M. Hays, Dr. D. L. Huntington, Dr. H. G. Piffard, G. M. Hambright, Dr. A. Fennel, Dr. C. Marshall, Dr. J. D. Rushmore, G. R. Metcalf, Dr. B. F. Gibbs, Oscar Oldberg, Dr. J. F. Judge, Dr. M. Roche, Dr. O. A. Wall, Dr. J. C. Peters, G. S. Palmer, Dr. R. E. Rogers, Dr. L. Johnson, W. J. C. Du Hamel, Dr. G. H. Fox, Dr. T. F. Wood.

The Convention then adjourned until 3 P. M.

First Day. Second Session.—The Convention reassembled at 3.30 P. M., and the report of the Committee on Nominations was read as follows: For President, Robert Amory, M.D., Brookline, Mass.; Vice-Presidents—Dr. S.C. Busey, Washington, Prof. P. W. Bedford, New York; Secretary, Dr. F. A. Castle, New York; Assistant Secretary, Dr. C. H. A. Kleinschmidt, Washington, D. C. The report was adopted.

Dr. Amory, upon taking the chair, made a few appropriate remarks, thanking the Convention for the honor conferred upon him.

Prof. Maisch moved that Dr. E. R. Squibb, of Brooklyn, be invited to participate in the affairs of the Convention with all the rights and privileges of a delegate. Carried unanimously.

Mr. A. B. Taylor, Secretary of the Committee upon Final Revision of the Pharmacopœia of 1870, read his report, which was accepted and adopted.

PRESENTATION OF REPORTS.

The following bodies presented reports upon the Revision: College of Physicians of Philadelphia, Philadelphia College of Pharmacy, Maryland College of Pharmacy, Louisville College of Pharmacy, American Pharmaceutical Association, Pennsylvania Pharmaceutical Association, Philadelphia County Medical Society, National Medical College, National College of Pharmacy.

On motion of Prof. Diehl, the President of the Pennsylvania Pharmaceutical Association, Mr. Chas. H. Heinitsh was invited to a seat in the Convention with all the rights and privileges of a delegate. Unanimously carried.

The following resolutions, offered by Prof. Maisch, were adopted:

Resolved, That the Committee on Nominations be instructed to nominate a committee of Revision and Publication, consisting of — members.

Resolved, That the Committee on Nominations be instructed to report a plan for revising and publishing the Pharmacopœia, and to make provision for the revision of the Pharmacopœia in the future.

The motion of Mr. A. B. Taylor, that the final committee consist of twenty-five members, was carried.

The Convention then adjourned to meet on Thursday, May 6th, at 12 M.

On being called to order at this hour, it was stated that the Nominating Committee were not ready to report, when an adjournment till 2 P. M. was called for and passed. This was repeated at 2 P. M., and the meeting adjourned till 10 P.M.

Thursday, May 6th. Second Day, Night and early Morning Session.—The Convention was called to order at 10 P. M. by the President. The report of the Committee on Nominations was read. The following were nominated and elected as the *Committee of Revision and Publication of the Pharmacopœia of the United States*:

Dr. Robert Amory, Brookline, Mass.
Dr. F. A. Castle, New York.
Dr. D. L. Huntington, U. S. Army.
Dr. B. F. Gibbs, U. S. Navy.
Prof. O. Oldberg, U. S. Mar. Hosp. Serv.
Prof. P. W. Bedford, New York.
Prof. C. Louis Diehl, Louisville, Ky.
Louis Dohme, Baltimore, Md.
Thos. Doliber, Boston, Mass.
Dr. Lawrence Johnson, New York.
Prof. J. F. Judge, Cincinnati.
Prof. J. M. Maisch, Philadelphia.
Prof. G. F. H. Markoe, Boston.

H. B. Parsons, Washington, D. C.
Dr. H. G. Piffard, New York.
Prof. Jos. P. Remington, Philadelphia.
Charles Rice, New York.
Dr. W. S. W. Ruschenberger, Phila.
Dr. E. R. Squibb, Brooklyn.
A. B. Taylor, Philadelphia.
W. S. Thompson, Washington.
Prof. O. A. Wall, St. Louis, Mo.
Dr. E. S. Wood, Cambridge, Mass.
Dr. T. F. Wood, North Carolina.
Prof. T. G. Wormley, Philadelphia.

The report of the American Pharmaceutical Association, so far as it relates to general principles, was practically adopted. These refer to the following points:

The text of the U. S. Pharmacopœia to be written in the English language. Titles of preparations, etc., to be in both Latin and English. An alphabetical arrangement of the subjects, use of synonyms, cross references, description of crude drugs, description of chemicals, introduction of chemical formulæ, processes for chemicals, expressions of quantity, numerical relations of quantities, fluid extracts, the best practical process to be left to final committee. Temperature to be expressed in both Centigrade and Fahrenheit. Definition of physical properties of drugs and preparations to be given. A uniform method of taking specific gravity to be prescribed. When definite expressions of weight are necessary, as in pills, etc., metric and apothecaries' weight to be used. Weight of finished product to be specified, and a number of tables were proposed to be appended.

The proposition to have a table of doses in the Pharmacopœia was negatived. A table of saturations to be added, and such other tables as might seem advisable.

The Committee of Revision and Publication was instructed to award the publication of the Pharmacopœia of the United States to the publishing house offering the best terms; the committee to hold the copyright, the price of the work to be fixed, and the book to be sold through the ordinary trade channels. The authority was also given to publish a new edition or a supplement to the Pharmacopœia at the end of five years, or oftener if necessary. The committee were instructed to fill all vacancies which may occur in its body, and to drop, by a vote of two-thirds of the committee, any member who may neglect to perform the work which he had accepted, or who failed to attend five consecutive meetings of the committee without valid excuse.

The committee were also empowered to employ expert labor.

It was ordered that the call for the next convention should include "all incorporated pharmaceutical and medical colleges, all incorporated pharmaceutical and medical societies, and the army, navy and marine hospital service of the United States."

It was resolved that the American Pharmaceutical Association and American Medical Association be invited to send delegates to the next convention.

The roll of the convention was called, and seventy-four delegates responded.

Dr. Minis Hayes called the attention of the convention to the fact that the "College of Physicians and Surgeons in the city of New York"¹ was a society

¹ This is not the College of Physicians and Surgeons (Medical Department Columbia College), which was represented also, but the New York County Medical Society in disguise (see "New York Medical Record," May 15, p. 551.

which had long since ceased to exist, and questioned the legality of the admission of their delegates, and moved that their names be dropped from the roll. Motion not carried.

The usual complimentary resolutions were then adopted, and the convention, at 1.45 A.M., May 7th, adjourned.

The Local Committee of Reception made elaborate arrangements for the entertainment of the visiting delegates with their ladies. A reception was held on the 5th at the Corcoran Art Gallery, on the afternoon of the 6th at the White House by the President of the United States, in the evening at the Naval Observatory by Admiral and Mrs. Rogers, and an excursion to Mount Vernon on the morning of the 7th was greatly enjoyed by those who attended.

Pennsylvania Pharmaceutical Association.—We would remind our readers resident in this State of the approaching meeting of this Association, to be held in Allentown on the 8th of June. The card of the Secretary of the Association, inviting those who desire to become members, is published on the inside of the cover of this number of this journal, and it would be well for the trade generally to respond by writing for the necessary blank applications.

Hay Asthma or Hay Fever.—Dr. R. H. Weber, of this city, has kindly communicated to us a copy of the prescription which he has uniformly found useful in the complaint mentioned. We have postponed its publication until now, at the approach of the season when hay asthma will again make its appearance. Dr. Weber regards the iodide of potassium as the active agent, but the best results have always been obtained when combined with bicarbonate of potassium and hyoscyamus. The formula is as follows:

R	Extracti hyoscyami,	.	.	.	.	gr. xii
	Potassii iodidi,	.	.	.	.	3i
	Potassii bicarbonatis,	.	.	.	.	3ii
	Extr. glycyrrhizæ depurati,	.	.	.	.	3iv
	Aquæ anisi,	.	.	.	.	3ivss

M. S. A dessertspoonful every four hours, day and night, until relieved. The medicine is to be continued for at least a week, in doses of a dessertspoonful four times daily.

OBITUARY.

JULES MURINGER, PH. G., was born Jan. 7th, 1853, in Philadelphia. He received his education in St. Mary's College, Wilmington, Del., and in the Gymnase Protestant, Strassburg, and after his return in May, 1868, entered the store of Charles Ellis' Son & Co. After graduating from the Philadelphia College of Pharmacy in March, 1872, he took entire charge of Ellis' Laboratory for three months, and served as assistant in the stores of Simes and Gust. Krause, until in October, 1875, he entered into business at 11th and Bainbridge Streets, where he remained until his death, April 4th last.

THE AMERICAN JOURNAL OF PHARMACY.

JULY, 1880.

ON THE EQUIVALENCE OF DROPS.

BY S. L. TALBOT, PH.G.

(From an Inaugural Essay.)

The design of the writer in experimenting upon this subject was to determine, if possible, some relation between the size of the drop and a minim of the same liquid, and thus enable any one to determine the number of drops of any given liquid that should be directed, to secure a uniform dose of said liquid.

The labor involved in this endeavor can be judged of when about 275 different liquids were experimented with and each one tested three times. The results, as summarized, show the general exactness which characterized the work of our former fellow-member, Mr. E. Durand, whose labors have been carefully reviewed by the author, and demonstrate most fully that minims only should be directed in prescribing quantities of liquids less than half a fluidrachm.

The whole experiments made show results according with Durand's and Bernouilli's statements, that the bulk of drops depends upon the density of the liquid, the cohesion of the constituent particles of it, and also upon adhesion, as shown by the variation when dropped from vessels of different material or shape. They also agree, for the most part, with the two general rules of Durand: "First. *That liquids with SMALL PROPORTION of water afford a SMALL DROP, and vice versa.* Second. *That amongst liquids containing a large proportion of water, those not charged with remedial substances give a larger and heavier drop than these same liquids having extraneous bodies in solution.*" In his second rule the word "HEAVIER" should be erased, as in the officinal solutions, in most cases, the bodies in solution cause increase in weight, which more than offsets or counterbalances the decrease in size; and the same statement is true of tinctures made with diluted alcohol. In nearly all cases the cohesion seems to be impaired by the interposition of bodies in solution, and cohesion would seem to exert a stronger

influence than anything else upon the bulk of drops; though, if this be true, the statement of Evan L. Gmelin, in his "Handbook," that "the cohesion of liquids is pretty nearly in proportion to their specific gravity," cannot be accepted; since alcohol (specific gravity .835) and mercury (13.5) afford nearly the same number of drops to the fluidrachm, and chloroform (specific gravity 1.480) yields a drop of less than one-fourth the size of a drop of water.

SUMMARY OF RESULTS.

To sum up the results of these experiments, as briefly as possible, it may be stated that the administration of powerful medicines by drops is always dangerous. A single fluid may, under differing circumstances, give drops varying greatly in size and weight.

Much diversity is found in the size of drops from different bottles, and a single bottle is inconstant in this respect. The most constant, and therefore the best bottles for dropping are those with ground necks and glass stoppers, and wide, thin, even lips. If bottle of this kind are used, each one should be carefully tested, and marked with the size of its drops as compared with a minim.

To drop from corks applied to the outer edge of lips of bottles is even less accurate than using the bottles alone. Much better results than either may be gained by the use of droppers; and of those tested, all of which are in more or less common use, the best is the Barnes dropper. Yet it will be seen that this does not accomplish all that is claimed for it, only two out of a dozen yielding "sixty drops distilled water to a fluidrachm," which is the claim for superiority set forth on each box cover.

Cohesion exerts the greatest influence upon the bulk of drops. Temperature has little effect, and rapidity of dropping, almost none.

The list of officinal liquids shows that the largest drop was yielded by syrup of gum arabic (44 to f3), and the smallest by chloroform (250 to f3). Of bromine the number of drops corresponds with chloroform, but it cannot be accepted as correct, on account of the extreme volatility of the liquid, which, notwithstanding caution, and as great haste as was compatible with successful counting, caused the loss of a large percentage.

Strict general rules cannot be laid down as to the corresponding size of drops of classes of preparations, though the volatile oils, tinctures, spirits, oleo-resins and fluid extracts may be grouped together, as yield

ing drops usually less than one-half the size of drops of water. Solutions, syrups and dilute acids afford drops but slightly smaller than water, excepting solution of nitrate of mercury and syrups containing or made from fluid extracts. Acids, wines, fixed oils, vinegars and mixtures give, in most cases, drops of more than one-half the size of water, about two-thirds.

In the drop measurement of the various classes of preparations in the United States Pharmacopœia there was found a noticeable uniformity; amongst the officinal wines the extremes showed a difference of but fourteen drops in the fluidrachm. The fluid extracts and tinctures, much larger classes, show, naturally, a greater range, but withal a regularity sufficient to suggest the addition of a list giving the average size of drops of each class. But four exceptions were found necessary; these are appended to the tabular list. It will be observed that the liquids yielding smallest drop are placed first in order in the following table:

Average Size of Drops of Classes of U. S. P. Preparations.

Class.	Average No. of drops in f5i.	Class.	Average No. of drops in f5i.
Ether and stronger, .	174	Mixtures, .	89
Fluid extracts, .	141	Vinegars, .	77
Spirits, .	141	Syrups not containing fluid extracts, .	69
Tinctures, .	136	Solutions (1 exception), .	66
Volatile oils, .	131	Diluted acids, .	61
Oleo-resins, .	124	<i>Exceptions.</i>	
Acids (3 exceptions), .	123	Solution nitrate of mercury, .	131
Wines, .	106	Nitromuriatic acid, .	76
Fixed oils, .	103	Muriatic acid, .	70
Syrups containing fluid extracts, .	97	Sulphurous acid, .	59

A CORRECTION.

In my article in the JOURNAL for April, on "Tests for Arsenic," I expressed the opinion that the subnitrate of bismuth might have contained arsenic. This is a mistake, and I hasten to correct it, as the chemist, Prof. Howard, testified in court that he had examined a sample of it and it contained none. As my attention was called to it by the professor, I now recollect that such was his testimony in court, and in justice to him I make the correction, as I have the highest confidence in his ability and thoroughness as an analytical chemist.

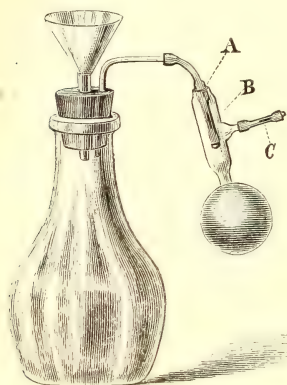
PHIL. HOGLAN.

Newcomerstown, O., May 24th, 1880.

A SIMPLE DEVICE FOR FILTRATION.

BY D. ANSON PARTRIDGE.

The cut represents a simple but efficient arrangement for filtration under atmospheric pressure.



ABC is a glass tube three inches in length, and about three-eighths of an inch internal diameter.

At *A* the tube is drawn tapering, to make it fit closely to a rubber tube three-sixteenths of an inch calibre, which passes inside of the glass tube. A short piece of glass tube is inserted into the rubber tube at *A* to make a tight joint; the lower end of this rubber tube is closed by inserting a short piece of glass rod. At *B* a smooth slit is made in the rubber tube three-eighths of an inch long (as

recommended by Bunsen) to act as a valve.

On the projecting short limb of the glass tube is a piece of rubber tube, one-eighth of an inch calibre and about one inch long; the outer end of this tube is closed by a piece of glass rod. At *C* a slit is made in the tube to serve as a valve.

The lower end of the glass tube is drawn out to adapt it to a rubber ball of about two inches diameter.

This little apparatus, when adapted to a pint flask, will, with a few compressions of the ball, afford a pressure equivalent to a column of water 8 to 10 feet high.

VOLUMETRIC ANALYSIS OF LIQUIDS AND SOLIDS.

BY ALFRED B. TAYLOR.

Analysis is the separation of a compound into its several parts.

Qualitative¹ analysis is the determination of the parts, without reference to quantities, while quantitative analysis determines also the quantities of the parts, thus showing their relative proportions.

¹ "Qualitive" and "quantitive" (from "qualis" and "quantum") would seem to be much better words than "qualitative" and "quantitative" (from "qualitas" and "quantitas"). Ti ta-tive is about as barbarous as "te-to-tum."

Quantitative analysis by weight, or gravimetric analysis, consists in separating and accurately weighing the constituents of a compound.

The necessary operations are frequently very complicated, occupying a long time, and in many cases require elaborate apparatus, as also the exercise of much care and experimental knowledge.

Volumetric analysis, or quantitative analysis by measure, on the other hand, is quickly performed, as a general rule is susceptible of extreme accuracy, and needs much simpler apparatus. The leading principle of the method consists in submitting the substances to be estimated to certain characteristic reactions, employing for such reactions solutions of known strength, and from the volume of solution required for the production of such reaction, determining the weight of the substance to be estimated, by aid of the known laws of chemical equivalence.

Suppose, for example, that it is desirable to know the quantity of pure silver contained in a "Bland dollar." The coin is first dissolved in pure nitric acid, by which means a bluish solution, containing silver, copper, and probably other metals, is obtained. It is known that chlorine combines with silver, forming a chloride of silver, which is insoluble in dilute nitric acid. The proportions in which the combination takes place are the atomic weights of the two substances, or 35.5 parts of chlorine to every 108 parts of silver; consequently, if a solution of pure chloride of sodium be prepared by dissolving in water such a weight of the salt as will be equivalent to 35.5 grains of chlorine = 58.5 grains of chloride of sodium (its molecular weight), and the solution be diluted to the measure of 1,000 grains of distilled water, every single grain-measure (or one-thousandth part) of this solution, upon being carefully added to the silver solution, will combine with 0.108 grain of pure silver to form chloride of silver, which, being insoluble, will be precipitated. In the process of adding the salt solution to the silver, drop by drop, a point is at least reached when the precipitate ceases to form, thus showing that all the silver has been separated from the solution. Upon carefully examining the graduated vessel from which the salt solution has been used, it at once becomes apparent how many grain-measures of liquid have been necessary to produce complete decomposition; and to obtain the answer to the problem is a simple matter of calculation.

For instance, suppose the quantity used to completely decompose the one-tenth part of the solution of silver was 343 grain-measures; this number multiplied by 0.108 (the amount of silver thrown down by

each grain-measure of the salt solution) will give the exact number of grains of pure silver contained in one-tenth of a dollar = $37\frac{1}{2}$ grains, or 37.125 grains of pure silver in the dollar.

The metric system of weights and measures is now used exclusively (for scientific purposes) in France, Prussia, Austria, Holland, Sweden, Denmark, Belgium and Spain, the unit of weight being the gram (= 15.43235 grains troy); a gram of distilled water at $4^{\circ}\text{C}.$ ¹ ($39^{\circ}\text{F}.$) measures exactly a cubic centimeter or a "fluigram;"² the kilogram contains 1,000 grams; the liter contains 1,000 fluigrams.

The following apparatus is required in the preparation and use of the necessary solutions:

1. A glass flask, which, when filled to a mark on the neck, contains one liter.
2. A graduated cylindrical jar, which, when filled to 0, contains one liter, and is divided into one hundred equal parts.
3. A burette, a graduated tube which, when filled to 0, holds one hundred fluigrams, and is divided into one hundred equal parts.

When volumetric analysis first came into use the test solutions were generally prepared so that each substance to be tested had its own special reagent, and the strength of the standard solution was so calculated as to give the result in percentages; consequently, in alkalimetry, a distinct standard acid was used for soda, another for potash, a third for ammonia, and so on, necessitating a great variety of standard solutions.

Griffin and Ure appear to have been the first to suggest the use of standard test solutions based on the atomic system.

Normal test solutions, as a general rule, are prepared so that one liter at $16^{\circ}\text{C}.$ shall contain the hydrogen equivalent of the active reagent weighed in grams ($\text{H} = 1$).

Decinormal solutions are made one-tenth, and centinormal solutions one-hundredth, of this strength.

In the case of univalent substances, such as silver, iodine, hydrochloric acid, sodium, etc., the equivalent and the atomic (or in the case of salts, molecular) weights are identical; thus a normal solution of

¹ It is customary to make the measurements with metrical apparatus at $16^{\circ}\text{C}.$ (about $60^{\circ}\text{F}.$)

² This name was suggested by the author in a paper published in the "*Medical and Surgical Reporter*," Feb. 24, 1877, p. 171.

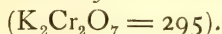
hydrochloric acid must contain 36.5 grams of the acid in a liter of fluid, and a normal solution of sodic hydrate, 40 grams.

In the case of bivalent substances, such as lead, calcium, oxalic acid, sulphurous acid, etc., the equivalent is one-half of the atomic (or in the case of salts, molecular) weight ; thus a normal solution of oxalic acid would contain $\frac{126}{2}$ or 63 grams of the acid in a liter of fluid.

Further, in the case of trivalent substances, such as phosphoric acid, a normal solution of sodic phosphate would be made by dissolving $\frac{358}{3} = 119.3$ grams of the salt in distilled water, and diluting the liquid to the measure of one liter.

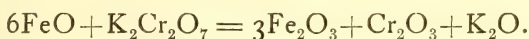
The following standard test solutions have been recommended to be introduced into the United States Pharmacopœia, the same being now official in the British Pharmacopœia :

1. *Volumetric Solution of Bichromate of Potassium.*



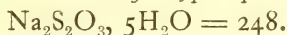
This is a decinormal solution, and contains 4.917 grams of the salt in one liter of the liquid.

The reaction which takes place between potassic bichromate and ferrous oxide is as follows :



It is therefore necessary that one-sixth of an equivalent in grams should be used in a liter for the normal solution, and one-sixtieth for the decinormal ; and as it is preferable on many accounts to use a dilute solution, the latter is the more convenient for general purposes.

2. *Volumetric Solution of Hyposulphite of Sodium.*

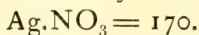


The normal solution contains 248 grams in the liter ; the decinormal solution is usually more convenient, and contains one-tenth as much, or 24.8 grams in the liter, while in some cases the centinormal solution is desirable. This can readily be prepared by diluting 100 fluigrams of the decinormal solution to one liter.

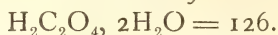
3. *Volumetric Solution of Iodine.* $\text{I} = 127.$

The solution directed in the Pharmacopœia is the decinormal solution, which contains 12.7 grams of iodine in the liter.

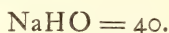
4. *Volumetric Solution of Nitrate of Silver.*



This solution is also the decinormal solution, and contains 17 grams of nitrate of silver (corresponding to 10.8 grams of pure silver) in one liter of liquid.

5. *Volumetric Solution of Oxalic Acid.*

Oxalic acid being bivalent, the normal solution is made by dissolving $\frac{126}{2} = 63$ grams of the acid in a sufficient quantity of water to make the solution measure one liter.

6. *Volumetric Solution of Soda.*

This is a normal solution, and contains 40 grams of sodic hydrate in one liter of liquid.

Might not the process of volumetric analysis be much simplified, and especially in view of the abandonment of measures of capacity by the U. S. Pharmacopœia, would it not be more in accordance with the plan of the work, if measures of capacity were abandoned here also? True, the process would no longer be volumetric, but the leading principle upon which the system is based would still remain.

It is proposed, then, that all test solutions should be made gravimetric instead of volumetric; that is to say, repeating, for example, the process of testing the amount of silver in a Bland dollar, the standard solution of chloride of sodium would be prepared by dissolving 58.5 grains of chloride of sodium in distilled water, and diluting the solution until it weighed 1,000 grains, instead of measuring 1,000 grain-measures, as before. In this case every grain (weight) of this solution, upon being added to the silver solution, will combine with 0.108 grain of pure silver, and no further observation is necessary than to note how many grains of the salt solution have been used. This plan would do away with all apparatus; the only instruments necessary to carry it out would be flasks or appropriate vessels in which to weigh the solutions, and an accurate set of scales and weights to weigh them.

Variations in temperature would not affect the results, and inasmuch as weighing can be done with more exactness than measuring, greater accuracy would be obtained.

This plan would be equally satisfactory with any system of weights, whether the British system or the metric system, or simply parts by weight were used.

This same principle applied to all the test solutions would, in my opinion, render the operation more easy of execution, retaining all the advantages and discarding some disadvantages of the present system.

The principal facts herewith presented have been derived from "The Systematic Handbook of Volumetric Analysis," by Francis Sutton, F. C. S., published London, 1876, to which the reader is referred for further information on the subject.

SOME REMARKS ON SYRUPUS GUAIIACI.

BY T. C. CRAIG, PH.G., M.D.

In the "American Journal of Pharmacy" for 1876, March No., page 139, the following formula appears:

<i>Syrupus Guaiaci.</i>			
R	Pulveris guaiaci,	.	℥xxxii
	Liquoris potassæ,	.	f 3ss
	Sacchari albi,	.	℔i (avoird.)
	Aquæ,	.	f 3viii

Fiat syrupus. Signa—Dose, a teaspoonful, containing 5 grains of guaiacum.

Having had occasion to make syrup of guaiac quite a number of times, and using this formula, I was surprised at finding very much of a residue left after making the syrup. As each teaspoonful of the syrup was to contain five grains of guaiacum, I thought it strange that so much of it should remain insoluble; hence I was led to investigate the subject and discover the fallacy if any existed.

I noticed that if I added a solution of caustic potash to the residue and filtered it the filtrate was dark brown, almost black. From this I concluded that the amount of solution of caustic potash prescribed in the formula was insufficient to extract the active principles of the guaiacum, and that the reason I had so much residue was that more caustic potash was needed; but how much? This I determined in the following way: According to recent authority (National Dispensatory) guaiac resin contains, as its active principles, guaiacetic acid and guaiaretic acid, the former to the amount of seventy per cent.; the latter, ten per cent.

The chemical formula for guaiacetic acid is $C_{38}H_{40}O_{10}$, and for guaiaretic acid is $C_{20}H_{26}O_4$. The combining weight of guaiacetic acid is 656 and that of guaiaretic acid is 330. The combining weight of caustic potash (KHO) is 56.

Now, to neutralize 656 atoms, molecules or grains of guaiacetic acid will require 56 parts of caustic potash; again, to neutralize 330 atoms, molecules or grains of guaiaretic acid will require 56 parts of caustic potash; then 656, the guaiacetic acid, plus 330 of guaiaretic acid will require 112 parts of caustic potash to neutralize them.

Guaiac resin consists, as before stated, of 70 per cent. guaiacetic acid and 10 per cent. guaiaretic acid—80 per cent. in all, or 80 grains in every hundred grains of the resin. According to our formula eight-tenths of all the guaiac resin should be dissolved, *i.e.*, eighty grains out

of every hundred grains of the resin. Every five grains of guaiac resin contains four grains of guaiaconic and guaiaretic acids; then five hundred and twelve grains will be the amount of the two acids present.

Now, 986 : 112 :: 512 : 58, or nearly four times the amount called for in the formula. Acting on the accuracy of this calculation, we made syrupus guaiaci, using 58 grains of KHO instead of the one-half fluidounce of liquor potassæ called for, and the result was a small amount of residue, a much darker syrup and, therapeutically and pharmaceutically, a better preparation. Allow me, then, in conclusion, to suggest the following formula for syrup of guaiac :

R	Pulveris guaiaci resinæ,	.	.	.	.	.	℥xxxii
	Potassic hydrate,	.	.	.	.	.	℥viii grs.
	Sacchari albi	.	.	.	.	.	℔i (avoird.)
	Aquæ,	.	.	.	.	.	q. s.

Dissolve the KHO in 8 fluidounces of water; moisten the guaiac with this solution; pack it in a percolator and gradually pour on the balance of the solution; when this ceases dropping add sufficient water to make the percolate measure eight fluidounces; add the sugar and dissolve.

A STUDY OF THE STRUCTURE OF DYE-WOODS.

BY DR. F. R. VON HOHNEL,

Lecturer in the Polytechnic Institute of Vienna.

Translated from "*Dingler's Polytech. Jour.*," by Prof. SAM'L P. SADTLER.

Having for some time been engaged upon a thorough histological and histo-chemical investigation of dye-woods, I recognized the necessity of establishing, aided by accurate macroscopic examination, some reliable means of distinguishing the various dye-woods from each other and from woods similar to them. The researches of Wiesner¹ and Vogel² afford all that can be desired as regards the completeness of our knowledge of these woods. It appeared, however, that one important point remained untouched, viz., reliable macroscopic recognition. The examination of dye-woods with the naked eye, or aided by the lens, as well as sufficient consideration of differential characters, appear to have passed unnoticed.

¹ Wiesner: "*Die Rohstoffe des Pflanzenreiches*," p. 552.

² Vogel: "*Untersuchungen ueber den Bau*," etc., in "*Lotos*," March, 1873.

To any one, possessing a microscope and micrometer, with some skill in the use of the same, aided also by the publications referred to, the task of distinguishing the different varieties of dye-woods is easy; but to a person having only a lens difficulties present themselves, the removal of which, as far as possible, is the object of this communication. I would return thanks to the gentlemen mentioned above for the material placed at my service. It was, in every respect, all that was required, and also affords sufficient guarantee for the general validity of the characteristics described below.¹

Having but a splinter of the wood, it is easy, with the help of a cross section, that can be got without trouble, to form accurate radial and tangential sections, as well as to produce cleavage planes, which would furnish all the cardinal points necessary for the carrying out of the following examination.

A preliminary examination of the cross section with the glass will show that dye-woods, and woods most nearly related to them, can be arranged in a number of groups, which, as regards their structure, are sharply defined and separated from each other, but within these groups reliable distinction is attended with great difficulty. The groups are: 1. Blue-wood. 2. The inferior varieties of Red-wood from America; Lima, Costa Rica, Santa Martha red-wood and others. 3. Brazil-wood, Sapan-wood and Coulteria Red-wood. 4. Red Sandal-wood

¹ For present information I will remark that the entire wood portion of the dye-woods, as regarded for present purposes, consists of parenchyma, wood fibre, medullary rays and ducts. The rays appear on the cross section, often to the naked eye, but always under a lens of 4 to 5 magnifying power, as delicate, pale, parallel lines, which are usually embedded in a darker, solid background, consisting of wood-fibre. The direction of the medullary rays is the radial. A section in this line is called the radial section. Perpendicular to the radial line (tangential) show on the cross section other fine and somewhat wavy lines, which represent the limits of the annual rays. The longitudinal section, perpendicular to the radial section, is called the tangential section. It intersects all the medullary rays obliquely, while the radial section lays them bare throughout its length. The wood fibres and ducts appear on the cross section as cut perpendicularly. The first form, to a certain extent, the background of the wood. They determine the hardness of the wood body, and in the cross section appear as dark, hard, closed masses of tissue, in which the masses of pale parenchyma are embedded as patches of round or obliquely stretched shape, or as adherent, narrow tangential bands or lines. In the masses of parenchyma, mostly characterized by peculiar arrangement, are the ducts and hollow tubes disposed lengthwise on the wood.

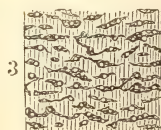
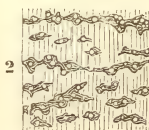
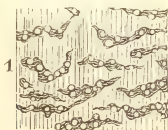
(African and Indian). 5. Cam-wood. 6. Maclura Yellow-wood. 7. Barberry-wood. 8. Rhus Cotinus Yellow-wood (Fustic).

All these groups can be distinguished from each other without the use of the microscope. The blue-wood (Campeachy), however, is not always easily distinguished from some of the inferior varieties of red-wood by studying its structure by the aid of the lens. I give below accurately described characteristics of the several groups, with particular reference to distinguishing properties of the individual woods. The accompanying figures are sections as seen with a lens.

1. *Blue-wood*.—The medullary rays are partly visible to the naked eye. There is also a dark brown background, approaching black in color, in which lie faint red lines, points and streaks. The cross sections of the ducts are not generally noticeable as such. In other cases (varieties in Domingo blue-wood) the pale parenchymous tissue predominates, and eventually forms the base in which the wood tissue (fibre) is lodged, in the form of small patches. In such cases the ducts are always somewhat wider and plainly visible as hollow tubes (to 0.25 mm. width).

Upon the tangential and radial sections the ducts can yet be plainly recognized as half tubes. (With Brazil-wood this is not the case.) The medullary rays are not visible on the tangential section. They appear radially as cross bands of very different widths, and clear and brilliant. The broadest medullary rays vary from 2 to 3 mm. in width; between them are visible delicate cross lines, corresponding to the small rays and never so regularly arranged as in Brazil-wood.

The lens discloses on the cross section a tissue arrangement as seen in Figs. 1 and 2. The clear but dull parenchyma is (as in all the figures) dark, and the medullary rays appear perpendicular. They never, as a rule, form exactly straight lines, and are characteristically of different thickness. When the parenchyma predominates, there the rays as well as ducts are more frequent and wider, and the latter are disposed in radial series.



The medullary rays very rarely occur tangentially, and under the lens nothing further of any importance is shown by either a tangential or radial view.

2. The inferior varieties of *Red-wood* from America are in structure intimately connected with the *Blue-wood*. Their color, however, distinguishes them, more or less readily, from the latter. In relation to structure and remaining properties, the Lima Red-wood (*Cæsalpina crista?*), Nicaragua Red-wood (*C. brasiliensis*) and others are not represented with accuracy.

Without the lens neither medullary rays nor annual growths are discernible on a cross section. The ducts are not at all, or only partially, visible. The arrangement of the parenchyma (Fig. 3) is the same as in the Campeachy-wood, only the structure is finer. The parenchymous spots appear more combined, and drawn out more delicately at their ends.

In the tangential section the ducts appear as dark lines, and the medullary rays are very short and delicate longitudinal lines, which are not (as with Brazil-wood) disposed in horizontal series. On a radial section are seen the medullary rays, 0.3 mm. wide. These, with reference to their width, may be classed as between the Brazil- and Sapan-wood. Under the lens, the cross section gives us Fig. 3. We notice here the duct openings, 0.14 to 0.1 mm. in width, and the very irregularly developed medullary rays, while true annual rings are not to be seen. The tangential sections show, especially in the poorer, lighter-colored species, the medullary rays very distinctly, as dark longitudinal strokes, which are irregularly divided, so that a wave appearance (Brazil- and Sandal-wood) is not produced. This is not even noticed in the radial section. The medullary rays occur mostly as short, broad cross bands, the ducts as shining, dark half tubes.

3. The Brazil, Sapan and *Coultéria* Red-wood agree with each other in the essential peculiarities of their structure. They all, for example, possess almost equally distributed duct pores, and round and very characteristic parenchymous spots.

Of all the red-woods, the *Coultéria* Red-wood (*Coultéria tinctoria*) has the finest structure. Its cross section presents almost exactly the same appearance as the Brazil-wood, only the annual rings are more distinct and the wood is colored more of a brown than a red. The tangential and radial sections are about the same as in the Brazil-wood.

The *Brazil-wood* presents in its cross-section a reddish-brown, hard, shining background, in which are noticed innumerable scattered pale red points. Many of these are indistinct and blurred. Without a

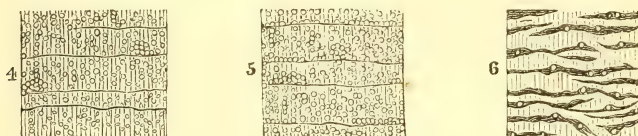
lens the medullary rays and annual rings are not discernible. The ducts on the tangential section appear as delicate, dark, longitudinal lines. Tangential cleavage planes exhibit very delicate cross-lines, which impart a wave-like appearance to the same. They originate from the medullary rays disposed in horizontal lines. The principal radial cross-section has a similar appearance. The medullary rays are all small, 4 to 5=1 mm. Fig. 4 represents a cross-section under the lens. The medullary rays are equally removed from each other, and almost equally strong. The annual growths are recognized as very delicate cross-lines. The parenchymous spots are rounded and not sharply defined. They contain several very narrow ducts which, however, on a cross-section and under a lens, are found to be distinct tubes. The parenchymous spots rarely adhere to each other; they never form tangential separated fascia.

A tangent view with the lens shows the medullary rays as delicate, short, dark, longitudinal lines, the ducts as dark, half-tubes, and the parenchyma as pale, longitudinal stripes. Upon both longitudinal views under the lens the wave appearance becomes more evident.

Sapan-wood (Fig. 5) exhibits on a cross-section larger parenchymous spots than the Brazil-wood. The duct cross-sections appear as holes to the naked eye. The annual rings are distinct. Characteristic paler and darker concentric fascia are formed by the parenchymous spots being in greater proximity on the internal edge of the annual growths. The medullary rays are just visible to the naked eye. The radial view does not disclose a wave appearance, although the medullary rays are more distinct than in the case of Brazil-wood (0.25 to 0.66 mm. high). The wave appearance is not observed on the tangent cross-plane. The medullary rays appear very distinctly as short longitudinal stripes, especially on cleavage surfaces. On both longitudinal surfaces the ducts appear as recognizable half-tubes. The lens shows the large duct sections very plainly, also the medullary rays, separated from each other by nearly equal spaces, and the narrow annual rings looking like lines. The parenchymous sheath of the ducts are relatively smaller than in the Brazil and Coulteria Redwood, often barely visible, so that the respective ducts appear to border closely on libriform. Nothing new is observed when viewed longitudinally under the lens.

4. *Red Sandal-wood* (*Pterocarpus santalinus*), in cross-sections, pre-

sents a dark red base, in which innumerable compact or more loosely-arranged cross-bands of dull, almost brick-red color, are lodged. At some places these bands appear swollen into knots, and in each swelling is found, on the rule, a duct of almost 0.3 mm. diameter, which is at once discerned by the naked eye to be a tube. The remarkably fine medullary rays are only visible with the lens, and are represented by figure 6. They are almost exactly of equal distance from each other, and somewhat curved about the larger ducts.



To the naked eye the tangent section appears covered with very delicate, slightly wavy cross-lines, which (as seen under the microscope) as with Brazil-wood, where they are less striking and finer, are produced by the regular disposition of the medullary rays; 5 cross-lines are equal to 1 mm. The ducts on the longitudinal sections appear mostly as somewhat bent, dark-brown and shining half-tubes. The radial section shows the small, almost equally high medullary rays, which form a wave. There is slight indication of longitudinal lines, resulting from the concentric parenchymous layer of wood fibre. The ducts are visible to the naked eye, complete and strongly lustrous. Frequently they occur on the radial cleavage planes as unaltered tubes. Under the lens the cross-sections of the medullary rays on the tangent planes are defined in the form of fine, almost black stripes, about 0.2 mm. in length. On the radial longitudinal section the medullary rays appear covered with very fine and innumerable cross-lines. The lens shows, too, the sections of the ducts, which are somewhat longer than broad, and very distinct.

The African sandal-wood cannot be distinguished macroscopically or microscopically from the Asiatic with any certainty. According to Vogel ("Lotos," 1873), it is probably a little brighter colored, and the ducts are somewhat larger.

5. *Cam-wood* (from *Baphnia nitida*) is very curiously constructed. The cross-section (Fig. 7) shows neither ducts nor medullary rays to the naked eye, but delicate, frail, wavy parallel or slightly divergent parenchymous zones. Under the lens the ducts appear as minute

points (finer than those of the Brazil-wood) of 0.08 mm. diameter. The medullary rays occur in scattered patches as remarkably delicate lines. The body of the wood-fibre is hard and black-red; the parenchymous bands are unbroken and cherry-red.

The tangential incision plane does not disclose any remarkable peculiarity in structure, even under the lens. Here and there are single widened ducts. Very characteristic are the longitudinal stripes on the radial incision plane; they are visible without the lens. They originate in the parenchymous zones; 4 to 6 of them equal 1 mm. The medullary rays appear as bright small bands of unequal width. Under the lens, a slight cross marking is observed on them. The ducts appear in spots as dark and shining longitudinal lines.

6. Old *Fustic* (*Maclura tinctoria*).—The cross sections show medullary rays without use of lens. The annual rings fail completely. This forms the most material difference between it and the *Maclura aurantiaca*. In the thick dirty-brown background, partly isolated, partly more or less removed, are besprinkled band-like compact parenchymous patches. (See Fig. 8.) The bands appear to be indented. The ducts are completely filled with parenchyma, and therefore the duct openings are not visible under a microscope.

The tangent section shows, in a brilliant background, innumerable regularly scattered, dark, short streaks (medullary rays), and tolerably broad, somewhat bent, ochre-yellow lines, which originate in the ducts filled with parenchyma. On the radial section the medullary rays appear as pale cross lines, about 0.2 to 0.25 mm. in width. Under the lens, they reveal 6 to 20 delicate lines, originating from the separate cell series. On the longitudinal section the ducts, under the lens, appear as if filled with yellow-colored scales, which are lustrous.



The wood of the *Maclura aurantiaca* is readily distinguished from that of old *Fustic* by the well-defined annual ring, also by the light and not ochre-yellow color of the parenchymous mass, and its much finer structure. The parenchymous patches are more oblique in position, and in the spring consist of ducts filled with parenchyma, etc.

7. *Barberry* (Roots of the *Berberis vulgaris*).—Intense lemon-yel-

low color. The naked eye will detect on the cross section a regular yellow background, in which are imbedded strongly converging, very broad, light yellow medullary rays. All of the latter are distinct. The ducts appear as small dark points, which are partly regularly distributed over the cross section, partly disposed in cross bands. Under the lens, the ducts are found to be empty, and nothing more is noticeable except what the eye would detect. The width of medullary rays on the cross section sometimes increases, and sometimes the opposite occurs. The annual rings are visible, but not so distinct as in the other yellow-woods. On the tangent section the medullary rays occur as nearly obliterated, broad longitudinal lines, the ducts as very thin dark lines. On the radial section the medullary rays appear over 2 mm. wide, and are furnished with horizontal lines.

8. *Rhus Cotinus*.—In a cross section the naked eye will perceive concentric light and dark cross bands. The ducts appear as small points, and the medullary rays are only indicated. On the tangent section the ducts are noticed, in an ochre-yellow ground, as light brown longitudinal lines. On the radial section the very small medullary rays occur rarely; the ducts appear as on the tangent section. Fig. 10 represents the cross section, under the lens. The fine medullary rays are only partially visible. The very narrow ducts are disposed in radial series and the entire wood fibre split up into brown, compact, ductless zones, and into yellow, porous, concentric layers, full of ducts. On the longitudinal sections the ducts appear complete and very lustrous, while the medullary rays are rare on the radial section. They are darker than the base, just as in the tangent section, where they appear as very minute, pale brown longitudinal lines.

From what has been said I believe I have made it evident that to crude organic products belong a number of properties which are visible to the naked eye and under the lens, but which have heretofore been too slightly appreciated in considering these articles. As the search for accurately distinguishing features between raw products, similar but of unequal value, is one of the principal ends in view in the study of such material, no method should be despised in order to arrive at the desired end. I hope the preceding communication will be received in this sense.

LONDON PURPLE.

BY C. V. RILEY.

From the "American Entomologist," Bulletin No. 3 of the U. S. Entomological Commission.

This powder is obtained in the following manner in the manufacture of anilin dyes. Crude coal oil is distilled to produce benzol. This is mixed with nitric acid and forms nitro-benzol. Iron filings are then used to produce nascent hydrogen with the excess of nitric acid in the benzol. When distilled, anilin results: to this arsenic acid, to give an atom of oxygen which produces rose anilin, and quicklime are added to absorb the arsenic. The residuum which is obtained by filtration or settling is what has been denominated "London Purple," the sediment being dried, powdered and finely bolted. The powder is, therefore, composed of lime and arsenious acid, with about 25 per cent. of carbonaceous matter which surrounds every atom. Experiments which I made with it in 1878 impressed me favorably with this powder as an insecticide, and its use on the Colorado potato beetle by Professors Budd and Bessey, of the Iowa Agricultural College, proved highly satisfactory. I was, therefore, quite anxious to test its effect on the cotton worm in the field on a large scale, and in the winter of 1878-79 induced the manufacturers to send a large quantity for this purpose to the Department of Agriculture. The analysis¹ made of it by Prof. Collier, the chemist of the Department, showed it to contain:

	Per cent.
Rose anilin,	12.46
Arsenic acid,	43.65
Lime,	21.82
Insoluble residue,	14.57
Iron oxide,	1.16
Water,	2.27
Loss,	4.07
	<hr/>
	100.00

Through the liberality of the manufacturers, Messrs. Hemingway & Co., a number of barrels of this powder were placed at my disposal the past season and distributed to various observers and agents in Georgia, Alabama and Texas. Early in the spring Mr. A. R. Whitney, of Franklin Grove, Illinois, found it to be a perfect antidote to the canker worms which had not been prevented from ascending his apple trees, and the experiments of those whom I had intrusted to make them

¹ Ordinarily the rose anilin has mixed with it a little ulmic acid and an increase of 2 per cent. of arsenic acid.

on the cotton worm, as well as those made under my own supervision, all showed that its effects are fully equal to those of Paris green. Like the latter it kills the worms quickly and does not injure the plants, if not applied in too great a quantity. Farther, it also colors the ingredients so as to prevent their being mistaken for harmless material. Finally, its cheap price removes the temptation to adulterate the poison, as every adulteration would prove more expensive than the genuine article. It is even superior to Paris green, as, owing to its more finely-powdered condition, it can be more thoroughly mixed with other ingredients and used in smaller proportion. Experiments on a large scale have been made with the dry application at the rate of 2 lbs. to 18 lbs. of diluents, also at the rates of 1, $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{8}$ lb. to 18 of the diluents. The last proved only partially effectual, and in no case were the plants injured or the leaves even burned. In all but the last case the worms were effectually killed, but as the mixture, at the rate of $\frac{1}{4}$ lb., was applied with greater care and regularity than is generally had on a large scale, and also in very dry weather, the proportion of $\frac{1}{2}$ lb. to 18 of the diluents is most to be recommended. All higher proportions are simply waste of the material.

Like Paris green, it is not soluble, but is much easier kept suspended in water than the former. If applied in this way some care has to be taken in stirring it in the water, as it has a tendency to form lumps, owing to its finely-powdered condition. Experiments on a large scale with this material diluted in water gave the following results: When used in the same proportion as Paris green, namely, 1 lb. of the poison to about 40 gallons of water, one experimenter reports that the leaves were slightly crisped, while four others report a perfect success and no injury whatever to the plant. Experiments by myself and Mr. Schwartz showed that when applied in the proportion mentioned and thoroughly stirred up in the water the leaves were partly crisped, though by no means so much as by arsenic, even when applied in weaker solution. When used in smaller proportion, or at the rate of $\frac{3}{4}$ or $\frac{1}{2}$ lb. to 40 gallons of water, it did not burn the leaves and still proved effectual in destroying the worms. Repeated experiment on a smaller scale confirmed these results obtained on large fields, and also showed that the proportion may be still farther reduced, and when applied with great care and in very dry weather $\frac{1}{4}$ lb. to 40 gallons will kill. Still farther reduction in the proportion of the powder used gave negative results. I would, therefore, recommend the use of $\frac{1}{2}$ lb. of this powder to from 50 to 55 gal-

lons of water as the proportion most likely to give general satisfaction by effectually destroying the worms without injuring the plants.

All that has been said under the head of Paris green as to the desirability of adding a small quantity of flour or other substance to give adhesiveness to the liquid will hold equally true of London purple, but the latter has in many respects a great advantage over the former, especially in its greater cheapness.

London purple has this farther advantage over other arsenical compounds hitherto employed: Its finely-pulverized condition seems to give it such penetrating power that, when used in liquid, it tints the leaves so that cotton treated with it is readily distinguished at a distance, the general effect being quite marked as compared with any of the other poisons similarly applied. It seems also to be more effectually absorbed into the substance of the leaf, and is therefore more persistent. At the same time experience shows that it does not injure the squares any more than Paris green.

JAPANESE BELLADONNA.

BY E. M. HOLMES, F.L.S.

Curator of the Museum of the Pharmaceutical Society.

In January last I received from Professor Flükiger, of Strassburg, a specimen of a root labeled "Japanese belladonna," and which, in his opinion, "seemed to contain atropia."

The root was totally different in character to true belladonna; but, having at that time no clue to its botanical source, I put it on one side for future investigation.

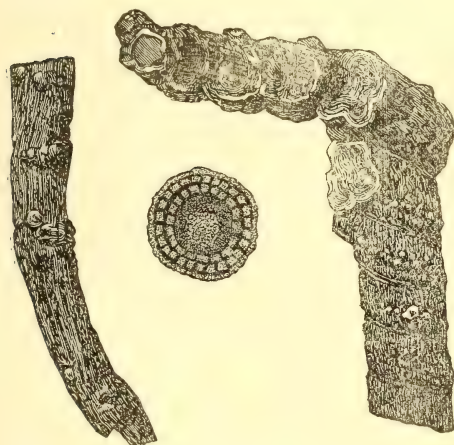
My attention was again called to this belladonna root by a sample received a few days ago from Messrs. Hearon, Squire and Francis, who informed me that it was offered at a drug sale in London early this month, but that no one bid for it.

Just at this time I had occasion to refer to a figure of *Scopolia carnio-lica*, Jacq.,¹ and was struck by the remarkable resemblance between the root of this plant, as figured by Jacquin, and the Japanese belladonna.

On turning to the recently published work by Franchet and Savatier on Japanese plants, I found that an allied species, *S. japonica*, Max., occurs in Japan, and that no other solanaceous plant there described.

¹ Jacquin, "Obs. Bot.," p. 20.

would be likely to have a stout rhizome like that of *scopolia*, most of the solanaceous plants of that country being either annuals, or suffruticose perennials, like *dulcamara*. On referring to Maximowicz's description of *Scopolia japonica*,¹ I found that he considered it to be the *Atropa Belladonna* of Japanese botanists. Although Franchet and Savatier record it only, on the authority of Tschonaski, from near streams on the highest mountains of Nikoo, and on that of Tanaka, from an unknown locality, yet it is well known that the Japanese cultivate several solanaceous plants, and probably this one among them, since it is figured both in the "Sô mokou Zousetz," vol. iii, fol. 17 (under the name of *Hashiri dokoro*), and in the "Phonzou Zoufou," vol. xxi, fol. 22 (under *Ro outo*). It would seem, therefore, to be a well known plant, and may reasonably be supposed to be as hardy as the *S. carniolica* of English gardens, and the root might well be an article of commerce in Japan.



Japanese Belladonna Root.—The left hand figure represents the root, the right hand one the twisted rhizome, and the central one a transverse section of the rhizome with the vascular bundles more marked than usual.

I entertain no doubt, therefore, that the Japanese belladonna root which has lately been offered for sale in Europe is the root of *Scopolia japonica*, Max. This species differs from the European one (*S. carniolica*) chiefly in its more acute leaves, which have constantly longer petioles, in the style being curved or declinate instead of straight, and in the teeth of the calyx being sometimes very unequal. The fruit is unknown. In size the Japanese plant equals robust specimens of the European species.

The rhizome, as met with in commerce, varies in length from 2 to 4 or 5 inches, and on the average is $\frac{1}{2}$ inch in diameter, cylindrical or slightly compressed, rarely branched, knotty and more or less bent and marked on the upper surface with circular, disc-like scars, where the

¹ Max., "Mel. Biol. in Bull. de l'Acad. Imp. des Sc. de St. Pétersbourg," vol. viii, p. 629.

leafy stems have arisen. It is the slightly alternate disposition of the nodes from which these stems arise which gives the rhizome its knotty character. No rootlets remain attached to the rhizome, but each node is surrounded with one or more indistinct rows of dots or scars, apparently indicating their presence. The rhizome is externally of a brown color, not white when abraded, as in belladonna, of a pale brown color internally, speckled with numerous very minute dots, which appear under a lens to be white and starchy, and scattered through a resinous or horny looking structure. The bark is so similar in color and so closely applied to the medullium as not to be readily distinguishable by the naked eye. The odor is slightly mousy and narcotic, and the taste hardly any except a slight bitterness. From portions which were mixed with the rhizome, it would appear to terminate in a genuine root of some length and thickness.

The recent investigations by Ladenburg, concerning the relationship of the solanaceous alkaloids to each other, seem to point out that the active principle of this drug might be worth examination, as well as that of its European congener.

A few remarks on the genus *Scopolia* may perhaps not be out of place here. It was founded by Jacquin on the peculiarity of the fruit, which is a capsule. The capsule, with the calyx and pedicel, fall off together, and after a time the capsule dehisces transversely, like that of henbane. In color of the flower and in foliage the plant so closely resembles belladonna that were it not for the fact that belladonna has a baccate fruit and no rhizome, even a good botanist might be led to call it an *Atropa*. The genus is named after Antoine Scopoli, an Idrian physician and professor of botany, who appears to have been the first to notice the European species.

The Japanese scopolia has the leaves often more or less deeply dentate, or even repand-dentate, in which character it presents an analogy to *Solanum nigrum* in this country, the leaves of which may sometimes be found quite entire and sometimes coarsely toothed.—*Pharm. Jour. and Trans.*, April 3, 1880.

THE HISTOLOGY OF ARAROPA or GOA POWDER.¹

BY THOMAS GREENISH, F.C.S.

Within the last few years much interest has attached to a drug imported from Brazil, and to which the native name "Araroba" is applied, and sometimes also "Goa" powder, from Goa, a Portuguese possession of that name on the Malabar Coast, through which it was imported into British India.

Its chemistry has been investigated by Professor Attfield and subsequently by Liebermann, the botanical characters of the tree whence it is produced have been described and illustrated, and so much of its history as has reached this country can be gathered from various papers in the pharmaceutical journals of the last five years.

The object of this paper is to deal with the histology of araroba, a substance at the present time employed chiefly, if not exclusively, for the production of chrysophanic acid.

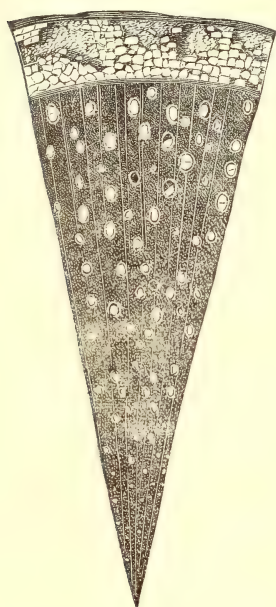
As met with in commerce araroba is in the form of a powder more or less agglomerated; mixed with it, and covered by it, are splinters of the wood in which this substance originates. The powder has an intensely bitter taste, and somewhat of a resinous adhesion to the fingers; it is said that the color is originally of a fine yellow, resembling sulphur, and that this by exposure gradually changes to a rhubarb color, and then darkens to that of aloes. Occasionally in the commercial powder lumps are met with, which, when broken, show internally a canary color, whilst the external parts are dark brown. A sample dried at 100 to 110°C. lost 1.98 per cent.

The drawing No. I represents a segment of a transverse section of the wood yielding araroba, from an authentic specimen deposited in the Society's Museum, and the fragments of wood found in the powder, from sections of which the other drawings were made, correspond with this in structure.

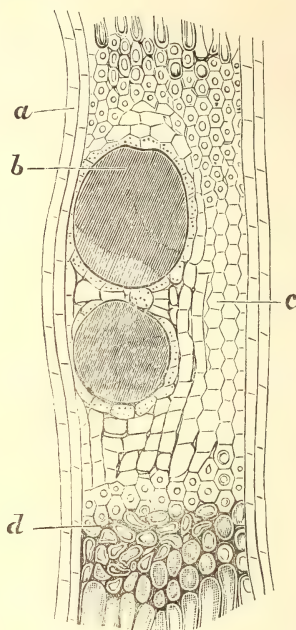
The bark externally is more or less covered with lichen, which gives it a somewhat grey and black patchy appearance. The epidermal tissue is for the most part thrown off by a suberous layer composed of a large number of cork cells compressed together and forming a layer of dense tissue; within this is a cellular tissue containing starch grains, and amongst these cells are sprinkled sclerogen or stone cells—cells much thickened by secondary deposit, and, therefore, equally with the cork cells, capable of great resistance to external or internal destruc-

¹ Read at the evening meeting of the Pharmaceutical Society, April 7, 1880.

tive influences. The granular protuberances seen in a section of the bark are due to these sclerogen cells being left intact, whilst those containing the starch grains have to some extent given way.



No. 1—Segment of *Araroba*.



No. 2—Transverse section of *Araroba*, enlarged.—*a*, medullary rays; *b*, porous vessels; *c*, parenchyma of wood; *d*, libriform cells.

With reference to the bark little need be said, as it does not appear to enter into the composition of araroba. Within the bark is the woody column, traversed from the medulla to the bark by narrow medullary rays colored by the araroba, and the round spots show the porous vessels, most of them also filled with the same substance.

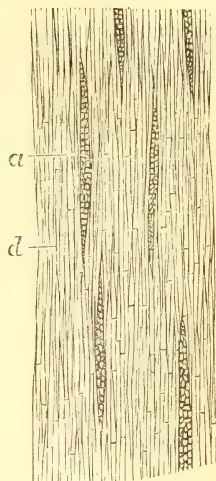
The drawing No. 2 shows a small part only of the woody column of this segment, enlarged as seen under the microscope, and bounded on either side by the medullary rays. The whole segment of No. 1 being only a repetition of this section, an explanation, therefore, of the cellular structure of this portion will give the cells comprising the whole. It exhibits four distinct forms of cells. There are the medullary rays, *a*, on either side; they are usually two cells wide, narrow, thin-walled and elongated in a radial direction. *b* represents porous

vessels, surrounded by the parenchyma, *c*, of the woody tissue, having some of its cells thickened and dotted, and *d* the libriform cells. This comprises the whole of the cell tissue of the wood yielding araroba.

The drawing No. 3 is a longitudinal section through the medullary and libriform cells, showing the latter disposed in their length as elongated pointed cells; the several cells composing these tissues were isolated and identified.

The first question that presented itself was, what tissues are involved in the formation of araroba? Under the microscope, either alone or in any fluid that does not change its nature, araroba presents the character of an amorphous powder; by heating it in a test-tube in a solution of caustic alkali, which dissolves about 80 per cent., it was hoped that some indication would be obtained, in the deposit, of cell tissues, but the result was not satisfactory. Recourse was then had to boiling in repeated portions of benzol, but with no better success. Adopting, however, the micro-chemical method, allowing the caustic alkali to run under a cover glass on the slide of moistened araroba, whilst under the microscope, and by this means dissolving away gradually the soluble portion of the powder, fragments of those cells just referred to as composing the several tissues were found and identified without difficulty.

In this manner broken portions of libriform cells and of porous vessels, also of cells of the parenchyma of the wood were discovered. Those of the medullary rays were too fragmentary to be distinguished satisfactorily; being a very delicate tissue it was scarcely expected otherwise. In no single instance were cork cells present, or any of the sclerogen cells before referred to as forming part of the bark; starch, although found in the cells of the parenchyma of the bark, has not been detected in any sample of araroba examined. It is fair to infer, therefore, that the bark does not form any portion of the araroba, although in some samples of it pieces may be found just in the same manner as pieces of the wood; also that from the fragments of the cells in the araroba, which were obtained by the process just mentioned, a conclusion may be arrived at that the whole of the cell tissue, com-



No. 3.

prising the woody column, from within the bark to the medulla, is involved in the decomposition, which results in the formation of araroba.

The next question that occurred was, what was the physical condition of this substance immediately resulting from the destruction of tissue? The araroba was found to have permeated more or less and imbued with color all the tissues, even those which retained their form, but it filled many of the porous vessels, as shown in No. 2, and whilst examining under a high power the deposit in one of these vessels remains of cell tissue were visible, so disposed as to convey the impression that the deposit must have once been in a fluid condition; and subsequent examination of sections from different pieces of wood, taken at random from a parcel of powder, presented other indications leading to the same conclusion.

It will be observed that the libriform cells, *d*, on one part of the section, pressing closely upon each other, are in their outline sharply polygonal, whilst at the other they are separating, and show indications of having been subjected to some solvent action; the cells have lost their polygonal outline and are gradually becoming loose and shapeless, and this is seen rather on the outside in contact with the powder than in the interior of the wood. It is difficult also to understand how the porous vessels in the interior of the wood could have been so densely filled, unless the araroba had been in a fluid or semifluid condition. That its presence in these porous vessels is not due to decomposition of the vessels themselves is evident from the fact that when the contents are removed by solution and the cell wall examined it is found to be intact. Did the araroba consist of finely comminuted cell tissue the action of caustic alkali would little affect it; but the solution of about 80 per cent. proves that the cell tissue has been changed to some other substance soluble in caustic alkali. So far as these investigations go they point to a fluid condition of araroba, whilst its presence in the clefts and hollow places of the wood, and the fact of more being found in old trees than in younger ones, must dispose at once of the idea of its being a secretion.

The most interesting point of the inquiry next suggested itself, the cause of this formation. On this point there is no satisfactory evidence; but araroba has its analogies in the gums and resins, and to the student of materia medica these obscure changes in plant organism are of especial interest. Kützing first observed structure in tragacanth,

but erred in considering it to be a fungoid growth. Mohl confirmed Kützing's observations that it possessed structure, but proved that the gum was due to a metamorphosis of the cell membrane, and the remains of cell tissue may very readily be seen under the microscope.

From the investigations of Wigand, Karsten and Wiesner, most of the natural resin which exudes from the coniferæ is due to a similar change in the starch and the cell membrane. The gums, of which gum arabic may be taken as typical, owe their origin to a similar change from an obscure cause in the interior of the tree. In one instance the medulla and medullary rays with the starch are involved and in another the bast cells of the bark.

This change has sometimes been called a degradation of cell tissue, but the word, restricted to its application in geology, is not a suitable term. If this had been a degradation, or rubbing down, of cell tissue the result would be nothing more or less than a mass of cell *debris*; but this is a disorganization or destruction of organic structure, resulting in the formation of a substance of a totally different character.

Last autumn in the forest of Thuringia resin was seen exuding from a large number of coniferæ and also gum from the cherry trees. A specimen which was brought home well illustrates a natural exudation of the cherry gum, and there seems little doubt but that the same natural law which governs the changes resulting in the formation of gums and resins governs also those which result in the formation of araroba, and that this substance was, equally with those named, originally in a fluid condition.—*Pharm. Jour. and Trans.*, April 10, 1880.

RAISINS.

The United States is the greatest raisin consuming country in the world, and uses annually more raisins than the whole of Europe. The market is mainly supplied from Spain, the raisins known as "Malagas" being considered the best. They come from a comparatively narrow strip of country in the south of Spain, which has hitherto been regarded as surpassing all other regions for raisins of that character. The annual yield of Malaga grapes averages 2,450,000 boxes of twenty pounds each. It sometimes reaches 2,500,000 boxes, and last season about 2,000,000 boxes were marketed. Of this enormous yield the United States takes fully one-half, on which it pays a duty—as on all other raisins—of two and a half cents per pound.—*Ibid.*

TESTING OILS.

Maumene found, says the "Textile Manufacturer," after experimenting with all the known methods for testing oils, the one with sulphuric acid to be the best.

This test is made as follows:—In a graduated cylinder, to hold 150 cubic centimeters, put 50 grams of oil, ascertain the temperature of the same, and add with a pipette 10 cubic centimeters sulphuric acid, stir with thermometer for a few minutes, and note the highest degree of temperature.

Pure olive oil gives an increase of 42 deg. C.

	Degrees.
50 grms. Pineseed oil give increase of	43
" " Tallow oil " "	41—43½
" " Ricinus oil " "	47
" " Horsefoot oil " "	51½
" " Oil of bitter almonds " "	52
" " Oil of sweet " "	52½
" " Rapeseed oil " "	58
" " Earth nut oil " "	67
" " Sesame oil " "	68
" " Hemp oil " "	98
" " Nut oil " "	101
" " Liver oil (Raja) " "	102
" " Cod (G. Morrhua) " "	102
" " Linseed oil " "	103

—*Journ. App. Sci.*, Feb. 2, 1880.

THE ADULTERATION OF OLIVE OIL,

And the various substitutes for it, have increased to such an extent of late years that the French Academy of Sciences in its last sittings had under its consideration the best practical means of detecting the nefarious traffic. The celebrated chemist, Dumas, indicated some of the methods that can be employed. The chemical tests are numerous enough, but cooks, as a rule, are wanting in the necessary knowledge to enable them to apply them. A very simple method is to watch the variety of shapes taken by different oils on the surface of water poured into a saucer. If the oil is genuine olive oil, the drop will take an irregular shape, like an islet well indented and marked with bays and promontories. If it is the product of the black garden poppy, the form will be at first round, but quickly festooning into elegant half circles round the edge. The same result will ensue with rape oil, but

the formations round the edge will be more pronounced. Arachis oil gives a circular drop, accompanied by a great quantity of fine little globules, as does oil of sesamé, in which the globules are, however, still more minute. Colza oil makes a precise and well defined circle. If there are one or more spurious oils mixed up with the true olive juice, the forms of the drops will resemble, more or less, the types above indicated, according to the greater or lesser proportion of the various adulterating substances. Oil which, when shaken in the bottle, assumes a permanent chaplet of air bubbles, is not pure olive oil, for in the latter air bubbles are only transitory. It may, therefore, be set down as a mixture in which rape oil predominates. Finally, there is an adulterant extracted from cotton seed, now largely employed by dishonest manufacturers, and which is about to engage the special attention of the Academy. This oil can be rendered colorless, and, as it possesses neither taste nor smell, affords great facility in falsifying olive oil. But it is of very little use for the Academy of Sciences or any other learned institution to expose these tricks of trade unless the laws are enforced against the adulterators.—*Jour. of Applied Science*, Jan. 1, 1880.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER, PH.D.

Inorganic Chemistry.—*On the Formation of Sulphuretted Mineral Water.*—A French chemist, Eugene Planchud, claims to have shown that the presence of sulphur in mineral waters is due to the reducing action of living vegetable matter on the sulphates contained in these waters. On examining under the microscope the long delicate threads found clinging to the stones in the neighborhood of sulphur springs and which are generally supposed to be threads of sulphur, the author discovered them to be composed of hollow cylindrical tubes matted together. Most of these tubes were filled with spores, which when liberated moved about with a rapid motion, finally came to rest and developed hair-like processes like those from which they had been discharged.

M. Planchud conjectured these hair-weeds to be the cause and not the consequence of the sulphur in the water. To prove this he made the following experiment: He filled three flasks with a solution of sulphate of lime; into one of these he put dead organic matter; into the other two, hair-weeds obtained from a sulphur spring. One of the

two flasks containing the hair-weeds he boiled to destroy the life of the weed and its spores. All three flasks were then sealed hermetically and allowed to stand under similar conditions. On opening them it was found that only the flask containing the living hair-weeds gave off sulphuretted hydrogen. The other flasks remained unchanged during several months. At the end of six months, however, the flask into which the dead organic matter had been put was found to smell faintly of sulphuretted hydrogen and on examination hair-weeds were found in it.—*Chem. News*, May 21, p. 236.

Action of Potassium Permanganate upon Potassium Cyanide.—E. Baudrimont has found that when the solution is alkaline the result of the reaction is an abundance of nitrous fumes and relatively little urea; if some acid (sulphuric), however, is added, urea is formed in abundance and with it carbonic, nitric, formic and oxalic acids, the latter as a decomposition product of the urea. The formation of these products is illustrated by equations.—*Compt. Rend.*, 89, 1115.

Dissociation of Iodine and other Halogen Elements.—J. M. Crafts announced recently (this journal, May 1880, p. 262) that, while free chlorine showed a normal density and was not dissociated even at the highest temperatures, free iodine was dissociated and apparently gave a density two-thirds of the normal value as first stated by Prof. Victor Meyer. Crafts has repeated and extended his observations and now gives the following as a summary of his results:

Temperature.	Density	Per. cent. of Normal Density.
455°	8.70; 8.78; 8.75	1.
677°—682°	8.06; 8.58	0.94
757°—770°—765°	8.05; 8.28	0.93
831°—878°	8.04; 8.11	0.92
1039°—1059°—1030°	7.18; 7.02; 6.83	0.81
1270°—1280°	6.07; 5.57	0.66
1390°	5.23; 5.31	0.60
1468°	5.06; 5.07	0.58

He concludes from these experiments that the vapor-density of iodine compared with air, diminishes *progressively* with the increase of temperature between about 600°, when it is still normal, to about 1470°, where it is only 0.58 of the normal density, and he supposes that a still higher temperature than that which he has thus far been able to obtain would give a half normal density. If this phenomenon is attributed to a dissociation it must be interpreted to mean that the molecule I_2 is separated into two atoms $I+I$ or else that a group which

represents a physical unity is separated into two parts, and he is not disposed to found upon these experiments any new hypotheses regarding the constitution of iodine.—*Ber. der Chem. Ges.*, xiii, p. 869.

Victor Meyer has just published a note announcing results confirming those of Crafts. He has, indeed, by the use of considerably higher temperatures than any yet applied, obtained figures lower than those of Crafts'. Thus he finds the density of iodine at the highest temperature reached to be 4.53 to 4.55 to 4.57.

The calculated density for I_2 is 8.79; for $\frac{2}{3}I_2$ is 5.83; for I_1 is 4.39. He proposes to continue the experiment in order to see if the limit is reached at 4.39, which would make the result one of simple dissociation as Crafts supposes, or if a density of 2.93 ($\frac{1}{3}I_2$) may be reached which would agree with the "chlorogen" hypothesis of the compound nature of the halogen elements.—*Ibid.*, p. 1010.

Organic Chemistry.—*On a Supposed Crystallized Chinoidin Borate.*—Julius Jobst has examined a compound described by Pavesi in "La Farmacia," 1879, No. 26, as a crystallized compound of chinoidin and boracic acid. He found that the yellow, scaly crystals, prepared as directed by Pavesi, when recrystallized several times from water, lost more and more of the chinoidin until finally scales of pure boracic acid only remained, easily recognized by their lustre and greasy feeling. He concludes, therefore, that the crystals examined were crystals of boracic acid, holding traces of chinoidin mechanically enclosed. The existence of a crystalline compound of chinoidin is, as far as the author knows, not as yet established.—*Ibid.*, p. 750.

The Alkaloids of Belladonna, Datura, Hyoscyamus and Duboisia.—Ladenburg, whose work in the preparation of artificial alkaloids has already been quoted (this journal, current vol., pp. 148 and 198), summarizes our knowledge of this class of alkaloids in a short notice:

Atropia Belladonna contains at least two alkaloids, which on account of their different specific gravity, may be designated as heavy and light atropia. The heavy atropia is the alkaloid commonly known under that name, first prepared pure by Meyn and established by Liebig as $C_{17}H_{23}NO_3$ in composition. Its gold-salt is lustreless and fuses at 135° — 137° . From its decomposition products the author reformed the alkaloid last year. The light atropia fuses at 107° and yields a gold-salt fusing at 159° , the analysis of which shows its composition to be $C_{17}H_{23}NO_3, HCl, Au, Cl_3$. This alkaloid is therefore identical with Hyoscyamina.

Datura stramonium contains, also, two alkaloids, which may be designated as heavy and light daturin. In this plant, as contrasted with *belladonna*, the lighter alkaloid predominates. The more difficultly soluble, heavy daturin fuses at 113.5° to 114° , and must be considered as a mixture of atropin and hyoseyamin. It yields a gold salt, fusing between 135° and 150° , out of which by crystallization, repeated six times, and by rejection each time of the mother-liquor, is obtained hyoscyamin gold chloride, fusing at 158° to 160° . From the mother-liquors by evaporation is obtained nearly pure atropin gold chloride, fusing at 135° to 140° . If the heavy daturin be repeatedly crystallized out of dilute alcohol pure atropin can be isolated from it, fusing at 113.5° to 114.5° , and yielding a lustreless gold salt, fusing at 135° to 139° . The light daturin is the alkaloid recently studied by Meyer and myself, and shown to be identical with hyoscyamin.

Hyoscyamus also contains two alkaloids, which may be distinguished for the present as crystalline hyoscyamin and amorphous hyoscyamin. The crystalline hyoscyamin has already (this journal, April, 1880, p. 198) been described. It is especially characterized by its shining gold salt, fusing at 159° , while atropin gold chloride fuses in boiling water. The hyoscyamin itself fuses at 108.5° , while atropin fuses at 113.5° to 114.5° . Its mydriastic action is in general similar to that of atropin, although in certain cases it appears to have a different action, as is shown in the use of duboisin, the identity of which with hyoscyamin the author has shown (*loc. cit.*, p. 198). The amorphous hyoscyamin, which comes into commerce as a brown resin, contains a hitherto unknown alkaloid, with the investigation of which the author is at present engaged. It is characterized by a very beautiful gold chloride salt, which is distinguished from either atropin gold chloride or hyoscyamin gold chloride by its much higher fusing point and its crystalline form.

Duboisia myoporoides apparently contains only the one alkaloid, the identity of which with hyoscyamina has been already (*loc. cit.*, p. 198) referred to.—*Ber. der Chem. Ges.*, xiii, p. 909.

Analytical and Applied Chemistry.—*Rapid and easy Process for simultaneously detecting Nitrogen, Sulphur and Chlorine in Organic Compounds.*—P. Spica gives the following concise method: The substance to be examined is heated with sodium in a test-tube and the product dissolved in water as in the ordinary way of testing for nitrogen by Lassaigne's process; the solution will then contain the nitrogen in the state of cyanide, the sulphur as sulphide, and the chlorine, bromine, or

iodine as chloride, bromide, or iodide if these elements be present. A drop of the alkaline liquid placed upon a clean silver surface will at once produce a black stain if a sulphide has been formed, whilst the cyanogen may be detected by the Prussian blue test in a portion of the liquid. If neither of these is present, the halogen may be at once tested for in another portion of the solution by adding nitric acid and silver nitrate, but if a sulphide or cyanide is present, it must be first destroyed by mixing the solution with about half its bulk of pure sulphuric acid and heating for a short time before adding the silver nitrate.—*Jour. Chem. Soc.*, May, 1880, p. 348, from *Gazzetta*, 9, 574.

The Coloring Matter of Sea-weeds.—Dyers and colorists generally will be interested in a paper by M. Descourt, read at a meeting of the French Academy of Sciences. Attention has been drawn to the violet color of oysters obtained in the basin of Arcachon, which color has been attributed by some observers to the iodine and bromine which the water, it was conjectured, might contain in excessive proportion, owing to their concentration through the absence of rain and the extreme dryness of the months of June, July and August. M. Venot, an oyster cultivator of Arcachon, requested M. Descourt to endeavor to ascertain the real cause of this coloring. After several unsuccessful researches M. Descourt's attention was attracted by a noteworthy circumstance. He had steeped some red algæ in a little of the sea-water with the object of studying them. Before proceeding to analysis, he washed the plants in distilled water in order to clean them from impurities. To his surprise the water took a splendid carmine-purple tint, which was the more astonishing as the sea-water in which the algæ had been immersed for some days had no trace of discoloration. A more complete examination of the algæ and of the colored solution enabled M. Descourt to explain the peculiar color of the oysters. Examined under the microscope, the fronds of the algæ were seen to have a mass of spores of a beautiful carmine color. These communicated no color to the natural sea-water of the basin; but when the latter was sufficiently diluted it took from the spores a splendid rose-color. Treated with alcohol and ether a beautiful green coloring matter similar to chlorophyll was obtained. Treated with distilled or fresh water a magnificent carmine-purple, slightly fluorescent, was produced. M. Descourt therefore concluded that the color of the oysters was due to the presence on the breeding-ground of a large quantity of these small algæ which belong to the beautiful rhodospERMæ or Floridæ families, genus

Rytiphlae purpuræ of Agarth. These algæ, says M. Venot, are very abundant on the Arcachon breeding-grounds and cause considerable loss to the cultivators, as they attach themselves to the valves of the young oysters and often carry these away. The spores furnish the animals with a very abundant, but highly-colored food. The molluscs assimilate the coloring matter, which is preserved, more or less modified, in the lobes of the mantle and the branchial plates when the sea-water is not sufficiently diluted by rain to dissolve the dye. A year or two ago the whole basin of Arcachon was subject to extreme drought, and hence the violet color and peculiar taste of the oysters.—*Jour. App. Sc.*, April, 1880, p. 45.

PHARMACEUTICAL NOTES.

BY R. F. FAIRTHORNE, PH.G.

Artificial Congress Water.—So many receipts for making artificial spring waters are constantly published in the pharmaceutical journals that it may, at first sight, appear superfluous to offer another, still most of the formulas for making a representative of Congress Saratoga Water hitherto given are mere imitations of that celebrated water, containing perhaps only two or three of the principal ingredients, and, in some instances, introducing in considerable proportion substances that do not exist in it naturally. I would therefore offer the following, which includes all the constituents of the true water in the proportions in which they are found, according to the analysis of a celebrated chemist; or, more properly speaking, the quantities of each ingredient are such that by double decomposition the proper proportions will be produced, namely:

Bicarbonate of sodium,	.	.	.	314 grains
Precipitated chalk,	.	.	.	85
Calcined magnesia,	.	.	.	24
Nitrate of strontia,	.	.	.	1
Sulphate of manganese,	.	.	.	2
Sulphate of iron,	.	.	.	1
Sulphate of potassium,	.	.	.	1½
Nitric acid,	.	.	.	1
Carbonate of potassium,	.	.	.	18
Chloride of sodium,	.	.	.	44
Bromide of sodium,	.	.	.	2
Iodide of sodium,	.	.	.	3
Alum,	.	.	.	2½
Carbonate of lithia,	.	.	.	8
Solution of silicate soda,	.	.	.	3
Muriatic acid, sufficient quantity.				
Carbonic acid water,				"

As magnesia or the carbonate as well as carbonate of lime are nearly insoluble in carbonic acid water in the state they are found in commerce, it is necessary that they should be freshly precipitated, when they will be readily dissolved by it. This is accomplished by dissolving them in sufficient muriatic acid, thereby forming the chlorides of magnesium and calcium. The 314 grs. of bicarbonate of soda, having been dissolved in 12 fluidounces of water, is added to the solution of the chlorides, when freshly precipitated carbonates are formed. To this mixture is added sufficient carbonic acid water to make a clear solution, which would therefore contain both bicarbonate of magnesia and of lime, and chloride of sodium formed by double decomposition. It will be observed that there are 44 more grains of chloride of sodium called for by the receipt. This completes the quantity of that salt contained in one gallon of the water. The rest of the ingredients, having been dissolved in carbonic acid water, are added, and the whole made up to one gallon with the same menstruum, will produce an artificial congress water that both in taste and effect bears the closest possible resemblance to the natural water.

Many persons have complained of the want of efficacy of artificially made waters, and of their not having the same properties as those which are natural. This, I believe, is due to the fact that the formulas by which such waters are made often differ from the analysis by omitting such ingredients as exist in small proportions. I have never found this objection made against the water as prepared by this formula, which I attribute to the retention of all the ingredients.

Aromatic Sulphuric Acid—A Suggestion Made.—It has often occurred to me that an improvement might be made or a substitute offered for the present formula, so that if necessary aromatic sulphuric acid could be made in a few minutes by using the tincture of ginger and oil of cinnamon instead of the powdered root and bark, thereby saving time and producing a perfectly satisfactory article in a few minutes. It differs somewhat in appearance from the officinal, being lighter in color, and is made in the following manner:

Take of	Sulphuric acid,	.	.	.	6 troyounces
	Tincture of ginger	.	.	.	4 fluidounces
	Oil of true cinnamon,	.	.	.	9 drops
	Alcohol,	.	.	.	1 pint and 12 fl. ozs.

Add the acid gradually to a pint of alcohol; when cool mix this with the mixture of tincture of ginger and remainder of the oil of cinnamon has previously been dissolved.

Wine of Tar.—As usually made, wine of tar is an unsightly, unstable and unpalatable article, but as prepared by the following receipt will be found free from these objections:

Take of	Tar,	4 troyounces
	Granulated sugar,	5 troyounces
	California sherry,	1½ pints
	Water,	sufficient quantity to make 2 pints
	Sand, washed and dried,	8 ounces

Rub the tar with the sugar and sand in a mortar, then with the wine and water. Pour into a bottle all the ingredients and agitate occasionally for 4 or 5 days. Filter with paper pulp, when a fine clear wine will result, highly impregnated with the tar, which will keep without undergoing acetous fermentation. By employing the California wine and water a preparation results that does not contain much more alcohol than would be the case if made by the ordinary plan. The employment of sand is on account of the mechanical division it effects.

How to Disguise a dose of Castor Oil.—It frequently happens that the druggist is asked to mix a dose of castor oil for a customer who is not able to come to the store, and as the common custom for disguising it is to mix it with soda water and sarsapilla syrup, it not unfrequently happens that before the dose thus mixed reaches the unfortunate individual for whom it was ordered nearly all the froth (on which the disguising effect of the mixture depends) has disappeared, and a nauseous "floating island" of oil meets the lips of the patient, disgusting still more his already nauseated stomach. Now, in order to obviate such a difficulty, I have found the following simple device to answer. The oil is poured on the top of the following mixture, namely:

Syrup of orange peel,	f℥i
Syrup of gum arabic,	f℥ss
Caramel,	f℥i
Tartaric acid,	xxv grains
Water,	f℥iv

M.

Having dissolved the acid in the water add the syrups and caramel and stir them up; then pour the oil on the top of this mixture. Wrap up 30 grains of bicarbonate of soda in a paper, which can be marked effervescing powder. When the patient is to take the dose the soda powder is added and well stirred, producing a thick froth which completely envelops the oil.

Mr. T. S. Wiegand states that he has found that by adding half a fluidrachm of the tincture of hops to the dose of oil as commonly mixed, namely, with soda water and sarsaparilla, that the froth of the mixture will remain for a considerable length of time, long enough in most instances to meet the requirements of the case.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

Detection of Fuchsin in Wine.—A contributor to the "Pharm. Centralanz." adds ammonia in excess to the wine, and then shakes with amylic alcohol, when the fuchsin, if present, colors the alcohol. E. Geissler tested this simple method (for another simple method see "Amer. Journ. Pharm.," May, 1876, p. 236) and found it excellent, although he does not comprehend how the fuchsin, after being transformed by the ammonia into colorless rosanilin, can color the alcohol. He also calls attention to the following fact, a knowledge of which may serve to avoid misunderstandings, namely: that fuchsin does not color wines permanently, but precipitates soon with the tannic acid and other combinations; the fuchsin even disappears from the precipitate soon by decomposing; this explains why fuchsin is sometimes proved to be present in wines when first examined and cannot be traced in it after standing for several years. Geissler therefore deems it prudent to test suspected wine for fuchsin without delay, and if the latter is found, to keep it and a sample of the wine as a proof of the adulteration.—*Pharm. Centralb.*, Feb. 12, 1880, p. 55.

For Night sweats of Patients suffering with Lung-phthisis, Dr. Kuehnhorn administered internally successively quinia, atropia, (the latter was also injected hypodermically), digitalis, boletus laricis, etc., and used externally cold lotions and a wash consisting of alcohol and tannin, with either *no*, or at least only *temporary* success. At last he prescribed with astonishing success a dusting-powder consisting of 3 parts salicylic acid, 10 parts starch and 87 parts Venetian talc, which was dusted all over the body, the skin of the latter if too dry, being first rubbed with alcohol and tannin so as to make the powder adhere. In order to prevent the irritation and coughing usually brought about by the dust of the acid it is necessary for the patient to press a cloth on mouth and nose during the dusting. The use of the powder prevented night sweats in every case without causing any other inconvenience.—*Pharm. Centralb.*, February 26, 1880, p. 74, from *Berl. Klin. Wochenschr.*

Seidlitz Chanteaud, an alledged dehydrated, effervescent and refreshing laxative, is one of the so-called elegant remedies, appears in the market in the shape of snow-white granules, and consists of a mixture of dry epsom salt, sugar and Seidlitz powder mixture (a mixture of rochelle salt, bicarbonate of soda and tartaric acid).—*Pharm. Centralb.*, February 26, 1880, p. 75.

A Curious Nostrum, advertised as "Corn-Magnet," and recommended for removing corns in five minutes, without pain, was analyzed and found to consist of sulphur pencils, colored dark with graphite and encased in tin. The alleged painless treatment consists in igniting one of these pencils and dropping one drop of the burning sulphur on the corn.—*Pharm. Ztg.*, February 14, 1880, p. 93.

Saint Barthelémy's Fever Liniment is made by Dr. Sézéric by the following;

R	Olei terebinthinæ,	.	.	.	125°0
	Tincturæ opii,	.	.	.	5°0
	Camphoræ,	.	.	.	3°0
	Olei olivæ	.	.	.	60°0

M. S. Apply for 6 minutes every 6 hours to the whole spine. After applying 3 to 4 times the intermittent fever stays away.

—*Pharm. Centralb.*, February 26, 1880, p. 72.

VARIETIES.

Mora's Hair Tonic consists of a mixture of castor oil, 22 parts; tincture bals. peruv., 22 parts, and alcohol, 360 parts.—*Pharm. Ztg.*, Feb. 25, 1880, p. 118.

A Brilliant Gloss can be imparted to pectoral troches by painting them with a thin, hot gelatin solution, darkened with a little solution of licorice.—*Ibid.*

Retinol, a patent lubricating oil, was analyzed, and proved to consist either of a not strictly pure retinol, which was obtained in a pure state by distilling pine resin, as a clear, oily, smooth tasteless and odorless liquid, not altered by light, and having the specific gravity 0.90 by Pelletier and Walter; or of an analogous product of the dry distillation either of resin, of bituminous slate, or of charcoal. It is, undoubtedly, an excellent lubricating oil, since it is not altered by age, does not thicken, and does not turn rancid.—*Pharm. Handelsbl.*, Feb. 25, 1880, p. 8, from *Bayr. Ind. u. Gewerbebl.*

Formulæ for Chilblains.—R Sulphuric acid, \mathfrak{Zi} ; spirit of turpentine, \mathfrak{Zi} ; olive oil, \mathfrak{Ziii} . Mix the oil and turpentine first, then gradually add the acid. To be rubbed on two or three times a day.

II. Lard, \mathfrak{Ziv} ; turpentine, \mathfrak{Zi} ; camphor, \mathfrak{Zii} ; oil of rosemary, \mathfrak{Mxv} . Rub in with continued friction.

III. Yellow wax, \mathfrak{Ziii} ; olive oil, \mathfrak{Ziii} ; camphorated oil, \mathfrak{Ziii} ; Goulard extract, \mathfrak{Ziss} . Melt the wax with the oil, then add the camphorated oil and Goulard extract.

The first two are for the unbroken, and the last for the broken chilblains.

IV. Beef's gall, $\mathfrak{z}\text{iv}$; ol. terebinth., $\mathfrak{z}\text{iv}$; spts. vini rect., 90 per cent., $\mathfrak{z}\text{iss}$; tinct. opii $\mathfrak{z}\text{i}$. Mix. Dr. Val. Mott.

V. Another formula for the same affection is beef brine, Oi; potassii nitratis, $\mathfrak{z}\text{ii}$; aquæ ammoniæ, $\mathfrak{z}\text{ii}$. Mix.—*Toledo Med. and Surg. Jour.*, February.

Salicylic Acid is detected in dark-colored fruit juices and wines by shaking well 50 cc. wine with 5 cc. amylic alcohol for a few minutes, decanting the alcohol, which collects on the surface after standing, into a test-tube, mixing with an equal bulk of spirits of wine, in which it dissolves, and adding a few drops of iron chloride, when salicylic acid, if present, produces immediately a dark violet coloration. Tannic acid, being scarcely soluble in amylic alcohol, will not prevent the reaction. —*Pharm. Centralh.*, Jan. 8, 1880, p. 16, from *Ztschr. f. Analyt. Chem.*

A Durable Black Stain for Wood, which is not destroyed by light, moisture or even by chloride of lime, is made by Dr. R. Godeffroy by first applying with a brush or sponge to the wood a solution of anilin muriate in water, to which a little copper chloride was added, and then after drying a solution of red potassium chromate in water.—*Ztschr. d. Allg. Oest. Apoth. Ver.*, Feb. 1, 1880, p. 55.

What is Butterpowder?—Hager invariably dispenses acid tartrate of potassium as butterpowder (10.0 for every 10 liters cream), claiming that by its use butter is made better and in greater quantity. The addition of 1 to 2 teaspoonfuls of cream of tartar to sweet cream will always bring the butter inside of an hour, even in the coldest weather, when churning is often exceedingly slow and almost seems impossible unless the cream is moderately sour. Other authors think that sodium bicarbonate is a better butterpowder, which is contradicted by Hager, who feels convinced that its use requires at least 2 to 3 times as much time, and that it yields at least 10 per cent. less butter.—*Pharm. Centralh.*, February 5, 1880, p. 50.

For Removing Nitrate of Silver Stains, Dr H. Krætzner recommends instead of potassium cyanide a solution of 10 parts sal ammoniac and 10 parts corrosive sublimate in 100 parts water, with which liquid the stains are said to be removed readily from the hands, linen, wool and cotton without injuring the fabric.—*Archiv d. Pharm.*, January, 1880, p. 52, from *Koller's neueste Erfind. u. Erfahr.*

If two parts Dry Silver Oxide are triturated in a porcelain mortar, or even when rubbed on writing-paper by means of a spatula with 1 part antimonium sulphide or amorphous phosphorus, the mixture will ignite very readily according to Prof. Bettger. Dry silver oxide will also ignite almost immediately when moistened with a single drop of phenol or creasote, prepared from beech wood tar or of commercial oil of cloves, a partial reduction of the silver oxide to metallic silver taking place.—*Archiv d. Pharm.*, January, 1880, p. 53, from *Polyt. Notizbl.*

Pharao's Serpents.—A new mass for this chemical toy is made by mixing together 2 parts potassium bichromate, 1 part saltpetre and 3 parts sugar, all in a dry, fine powder, and making into a mass with sufficient balsam Peru.—*Pharm. Centralh.*, February 5, 1880, p. 52, from *Polyt. Notizbl.*

The cause of large blackish-gray stains formed on silver spoons when immersed in beef soup, which was subsequently eaten with impunity, was investigated by Torquato Gigli, whose investigations prove that:

1. Powdered sulphur dissolves in the fat of meat without imparting to the soup a peculiar taste or odor, unless the quantity of sulphur is large.

2. In this condition of solution, and at a temperature very near that of boiling water, the sulphur readily combines with silver, forming black silver sulphide. In this particular case the stains on the silver spoons consisted of black silver sulphide, and were caused by powdered sulphur which, through carelessness or otherwise, had fallen into the kettle, or had in some manner been mixed with the meat used in the preparation of the soup.—*Schw. Wochenschr.*, Feb. 20, 1880, p. 59, from *Orosi*, August, 1879.

So-called "Fluid Meat," an English nostrum recently introduced into the German market, is said to contain all the nutritive constituents of meat without the fat in a liquid form, to be very nutritive for this reason without requiring digestion, and is therefore particularly recommended in all cases in which the stomach is supposed, on account of want of gastric juice, no longer to be able to transform the albuminous substances into soluble combinations. Two tablespoonfuls of it are said to contain the nutritive constituents of 625 grams of meat. M. Rubner's analysis proved, however, that it would be necessary for a patient to consume 336 grams "fluid meat" daily in order to get 80 grams albumen or pepton, which would make it altogether too expensive, and therefore objectionable as nutriment.—*Phar. Centralh.*, Feb. 19, 1880, p. 67, from *Dingl. Journ.*, from *Ztschr. f. Biologie*, 1879.

Influence of Vichy Water on Digestion.—M. Leven read before the Société de Biologie of Paris an account of certain experiments which he had recently made in conjunction with M. Sémerie in regard to the action of Vichy Water upon the digestion. The first effect of the injection of Vichy Water was found to be a very marked congestion of the liver. In an animal which had drunk 300 grams of the water the weight of the liver was found, after a short time, to have increased by 80 grams. Experiments were also made to determine whether Vichy Water aids the digestion of foods. A dog was fed upon 200 grams of cooked beef and 150 grams of pure water, and was killed at the end of three hours, when all the food was found in the stomach. A second dog was then fed with the same quantity of meat, but the fluid was replaced by 150 grams of Vichy Water, and it was found that at the expiration of three hours 76 grams of the food had disappeared from the stomach. Experiments upon the digestion of bread gave analogous results. Thus, the stomach of a dog who had eaten 200 grams of bread contained three-fourths of the whole quantity at the end of five hours, while a dog who had eaten 200 grams of bread, and had drunk 150 grams of Vichy Water, had almost finished its gastric digestion in five hours, since only 50 grams remained.—*Le Progrès Médical*.

Araroba ; Goa Powder.—According to Holmes (“La Presse Médicale Belge”) the araroba comes from a plant of the family *Cæsalpinaceæ*; according to Aguilar, on the other hand, the plant is a Leguminous of the genus *Andira*, having considerable analogy to *Andira inermis*, which furnishes the bark formerly employed as a vermifuge. This not yet having been studied, Aguilar gives it the name *Andira araroba*. The *Andira araroba* is met with wild in the southern part of the province of Bahia. The araroba powder must be the product of oxidation of a resin existing in large quantities in the wood of the tree. Insects boring holes in the wood favor the entrance of air and the consequent oxidation of the resin.—*Med. Press and Circular*, from *Cincinnati Lancet and Clinic*, May 22, 1880.

Remedies for Sea Sickness.—Cory, lately surgeon on a passenger steamer, recommends in *mal de mer* a combination of small doses of bromide of potassium and hydrate of chloral taken with the citrate of magnesium during effervescence. Spirits of sulphuric ether may be added when there is much depression.—*Lancet*, March 20, 1880, from *St. Louis Courier of Med.*, May, 1880.

MINUTES OF THE COLLEGE.

PHILADELPHIA, June 28th, 1880.

A stated meeting of the Philadelphia College of Pharmacy was held this day at the Hall, No. 145 North Tenth street. Dillwyn Parrish, President, in the chair; thirteen members present.

The minutes of the last stated meeting were read, and, on motion, approved.

The minutes of the Board of Trustees for April, May and June were read by Thomas S. Wiegand, and, on motion, adopted.

These minutes make mention of the appointment of a committee of the Board in May to purchase the houses in the rear of the College adjoining, on Elwyn street, which committee reported at the meeting of the Board in June that they had succeeded in obtaining the property within the limit authorized by the Board.

These minutes further contain the following communication :

“PHILADELPHIA, April 6th, 1880.

“With a view of stimulating the use of the microscope in Pharmacy and the more thorough investigation of vegetable drugs of American origin, the undersigned respectfully submits to the Board of Trustees, for approval and for publication in the forthcoming announcement, the offer of a prize, at the expense of the undersigned, to the class of 1880-81, said prize to consist of a Zentmayer microscope, American histological stand, with rack and pinion, two eye-pieces and two objectives, in walnut case, and to be awarded

1st. “For the best meritorious thesis describing the structure of two or more closely related American Drugs of vegetable origin, and accompanied by original drawings and by specimens; or,

2d. “For the best meritorious thesis describing the structure and the proximate constituents of an American drug of vegetable origin, and accompanied by specimens and original drawings; or, if no thesis should be deemed of sufficient merit,

3d. "For the best and most satisfactory description of the histology of vegetable drugs at the annual examination in March, 1881.

"Very respectfully,

JOHN M. MAISCH."

The following gentlemen were elected delegates to represent this College at the annual meeting of the American Pharmaceutical Association, which will be held at Saratoga, on the second Tuesday in September next, viz.: Messrs. Alonzo Robbins, Samuel S. Bunting, Charles W. Hancock, Dr. Roger Keys and Charles A. Heinitsh.

And to attend as delegates to the convention of Teaching Colleges, Messrs. Charles Bullock, Prof. John M. Maisch and Prof. Jos. P. Remington.

There being no further business, then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Massachusetts College of Pharmacy.—At a meeting of the Massachusetts College of Pharmacy held June 3d, 1880, the following were elected delegates to the Convention of Teaching Colleges, to be held at Saratoga in September: Professor G. F. H. Markoe, Ph.G.; S. A. D. Sheppard, Ph.G.; C. A. Tufts, M.D., Ph.G.

The following gentlemen were elected delegates to the Twenty-eighth Meeting of the American Pharmaceutical Association at Saratoga: Prof. G. F. H. Markoe, Ph.G.; Edw. S. Kelley, Ph.G.; S. A. D. Sheppard, Ph.G.; T. Doliber, Ph.G.; Prof. E. L. Patch, Ph.G., and as alternates, C. I. Eaton, D. G. Wilkins, Geo. F. Dinsmore, B. F. Stacy, and T. L. Jenks, M.D.

The New York State Pharmaceutical Association met on the 19th of May at Syracuse, and was called to order by Prof. P. W. Bradford, of New York. They were welcomed by Mayor Hendricks as visitors and by Dr. H. D. Didama on behalf of the medical profession. The meeting was a great success, 130 new members having been elected. The following gentlemen were elected officers for the ensuing year: President, Prof. P. W. Bedford, New York; 1st Vice President, G. M. Baker, Brooklyn; 2d Vice President, Frank Hamilton, Syracuse; 3d Vice President, H. B. Napier, Oswego; Secretary, Clay W. Holmes, Elmira; Treasurer, Wm. Blaikie, Utica.

The Committee on Legislation reported the draft of a law regulating pharmacy in the State, which, after discussion and a few amendments, was unanimously adopted.

The pharmacists of Syracuse entertained their visitors most kindly, and all seemed to be gratified with their visit. The next meeting will take place in Buffalo.

Pittsburgh College of Pharmacy.—The Board of Trustees of the Pittsburgh College of Pharmacy held a special meeting, and elected the following faculty for the ensuing term: S. Henry Stevens, Professor of Pharmacy; George W. Allyn, M.D., Professor of Materia Medica and Botany; Hugo Blane, Ph.D., Professor of Chemistry. The approaching term begins October 1st, and the prospects are very flattering for a large class in each department.

Pennsylvania Pharmaceutical Association.—The third annual meeting of this Association was held in Sænger Hall, Allentown, on Tuesday and Wednesday, June 8th and 9th, 1880. About sixty members were present. President C. A. Heinitch called the Association promptly to order at 3 o'clock P.M., June 8th. Dr. E. G. Martin, Mayor of Allentown, in a neat speech welcomed the Association to the city. The president, after returning the thanks of the Association, proceeded to deliver his annual address. At the conclusion of this address it was, on motion, referred to a committee of three to report upon the suggestions contained in it.

Messrs. Randal Rickey and Arthur G. Smith, delegates from the New Jersey Pharmaceutical Association, presented their credentials, and the president invited them to seats on the floor and to participate in the deliberations of the meeting.

The remainder of the afternoon was occupied in electing members, and in listening to the reports of the officers and the special committees appointed a year ago. The Secretary reported the publication of 500 copies of the Proceedings of last year, 200 of which still remain on hand. The treasurer reported a balance of \$465.09 in the treasury. The Executive Committee reported the admission of 9 members since the last annual meeting, making the total number 146. Subsequently this committee reported 51 applicants for membership, all of whom were elected by ballot.

Reports were also read from the Committee on Legislation and Trade Interests, and the Committee on Adulterations and Sophistications, and the chairman of the Committee on Queries reported 16 queries to be answered at the next annual meeting. The report of the Delegates to the American Pharmaceutical Association was read by Mr. Samuel Gerhard, of Philadelphia.

The president appointed Messrs. Alonzo Robbins, J. W. Landis and Wm. Turner a committee to report upon the articles placed on exhibition.

Mr. G. W. Kennedy offered the following resolution: Resolved, that a committee of five be appointed for the purpose of drafting a bill regulating the practice of pharmacy, sale of poisons and preventing the adulteration of food, to be presented to the next Legislature. The president, upon the adoption of this resolution, appointed the following committee: Messrs. G. W. Kennedy, John M. Maisch, John T. Patton, J. H. Boher and Wm. Harris. A communication from Smith, Kline & Co, of Philadelphia, inviting the Association to participate in an excursion over the Switchback Railroad was read by the secretary, and on motion of Mr. Landis the invitation was accepted with the thanks of the Association.

A communication signed by Messrs. Turner & Wiegand, a committee of the Trade Association of Philadelphia druggists, requesting this Association to act in conjunction with their organization to induce our representatives in Congress to use their influence in relieving the trade from the unjust tax and odium cast upon us as liquor dealers.

The second session on Wednesday morning was called to order by the president at 9 A. M. The credentials of Mr. Clay W. Holmes, a delegate from the New York State Pharmaceutical Association, were read, and he was invited to a seat and to participate in the deliberations of the meeting.

The Committee on the President's Address approved of the following recommen-

edations: 1st. To pay the secretary \$50 per annum. The salary of the treasurer, on motion of Prof. Remington, was also made the same. 2d. To elect delegates to the New York and New Jersey Pharmaceutical Associations. 3d. To appoint a committee to draft a bill on the regulation of pharmacy to be presented to the Legislature. 4th. To appoint a committee to prepare a code of ethics for the Association, and a committee on local and private formulæ. 5th. To appoint a committee to prepare an article relating to apprentices in the drug business. 6th. To pass a resolution endorsing the action of the Western Druggists' Association in the repeal of the stamp tax on proprietary medicines and perfumery, and send a copy of the same to the Commissioner of Internal Revenue and the proper committee of the Senate and the House of Representatives.

The following officers were elected for the ensuing year: Geo. W. Kennedy, of Pottsville, President; George A. Kelly, of Pittsburgh, 1st Vice President; Alonzo Robbins, of Philadelphia, 2d Vice President; Joseph L. Lemberger, of Lebanon, Treasurer; Jacob A. Miller, of Harrisburg, Secretary; James A. Meyers, W. F. Horn and Jacob H. Stein, Executive Committee. Prof. Remington, from the committee on certificate of membership, reported that seventy certificates had been issued during the past year.

A communication from the druggists of Allentown, inviting the members and their friends to partake of a banquet at the Allen House on Wednesday evening at 9 A. M. was received with thanks.

Prof. Remington offered the following resolution, which was adopted:

WHEREAS, The custom of providing entertainments of various kinds for the members of the Pharmaceutical Association is one which greatly impairs the usefulness of such association by consuming valuable time, interfering with the regular business and imposing upon the local committees such an amount of responsibility, trouble and expense, which dignified scientific bodies should refuse to exact; it is therefore

Resolved, That the Pennsylvania Pharmaceutical Association record their disapprobation of such entertainments, and instruct the association hereafter to decline to make arrangements for the purpose.

Mr. Turner read the report of the Committee on the Exhibition of Drugs, etc. Articles were there from eight different houses. The committee regret there was no creditable display of home-made chemicals and pharmaceutical preparations.

Mr. Cressler, chairman of the committee on the time and place for holding the next meeting, reported in favor of Williamsport, and the 2d of June, 1881. The report was accepted, and Mr. Edw. A. Cornell, of Williamsport, was elected Assistant Secretary.

Prof. Remington moved that a committee of five from the Philadelphia Trade Association be invited to co-operate with a similar committee from the Pennsylvania Pharmaceutical Association, which was adopted.

President Kennedy read a paper in answer to the following query:

Phosphate of sodium is said to be adulterated with carbonate and sulphate of sodium. Is this correct? A qualitative analysis of the article is desirable.

Prof. Remington read Louis Emanuel's paper in answer to the following query:

What addition to epsom salis will diminish its bitter and nauseous taste without materially altering its properties?

The Association adjourned at 12 M. to meet at 2 P. M.

THIRD SESSION. The Association met at 2. P. M. to listen to the lecture of Prof. Remington on the metric system. At the close of this address, 3 P. M., the president called the Association to order and announced the following committees: Committee on Trade Interests and Legislation—Dr. Geo. Ross, Wm. Harris, Jay H. Boher, W. D. E. Hayes, Wm. L. Turner, Dr. H. B. Parry, John A. Weaver, John P. Thompson, J. W. Landis and Thomas Deibert. Committee on Adulterations and Sophistications—Geo. A. Kelly, Alonzo Robbins and C. H. Cressler. Committee on Papers and Queries—Samuel Campbell, W. F. Horn and James B. Cherry. Committee on Ethics and Local and Private Formulæ—Charles T. George, John B. Raser, Herman Rabenan, Samuel Campbell and C. C. Hagenbuch. Committee on Apprentices relating to the drug business—P. M. Ziegler, Dr. Wm. H. Egle and Jos. P. Remington. Delegates to the American Pharmaceutical Association—L. H. Harris, Jacob H. Stein, C. L. Lochman, J. A. Meyers and Charles C. Klump. Delegates to the New Jersey Pharmaceutical Association—P. S. Brugh and Robert Walch. Delegates to the New York State Pharmaceutical Association—Charles A. Heinitsh and V. E. Shaw.

A vote of thanks was given Prof. Remington for his valuable and interesting lecture.

An hour was occupied in general interchange of views among the members regarding the merits and the best mode of manufacturing certain pharmaceutical preparations.

Mr. Charles T. George was asked to prepare a paper on the relative value of the various extracts of meat in the market, which he promised to have ready for the next annual meeting.

Prof. Remington offered the following:

Resolved, That the chairman on papers and queries be requested to secure from members as many promises to answer queries as possible at the time of the meetings.

Dr. Purcell offered the following amendment to the By-laws, Art. 1, ch. 2d.: After the words "professional standing" shall be inserted "of not less than twenty-one years of age and three consecutive years of practical experience," which was laid over till next meeting.

Mr. Lemberger offered a resolution that the secretary be authorized to send a Copy of the Proceedings to the president, secretary and chairman of the Executive Committee of each State Pharmaceutical Association, which was adopted.

Mr. George presented a copy of the report on the revision of the Pharmacopœia, which was prepared by the committee appointed by the Association last year and handed in to the Decennial Convention which met at Washington on the first Wednesday of May. The report was received and ordered to be printed with the proceedings.

There being no further business, after the adoption of a few resolutions of thanks to the assistant secretary, Mr. C. C. Klump, the druggists of Allentown, the citizens and the press, the Association adjourned to meet in Williamsport the second Tuesday in June, 1881. In the evening the members were handsomely entertained at the Allen House, and on the following morning forty-seven members and ladies, under the escort of Mr. M. N. Kline, took a ride over the Switchback.

Ohio State Pharmaceutical Convention.—The second annual convention of this Association was held in Dayton on the 19th ult., in the Association Hall, Dr. J. F. Judge, of Cincinnati, the President, being in the chair. From the report, as published in one of the papers, the meeting was eminently successful, 145 members having been elected at the first session.

A number of papers upon subjects of interest to the profession were read, and referred to the Committee on Publication, and some ten subjects were allotted to members for investigation, to report at the next annual meeting, which is to take place in Toledo on the third Wednesday in May, 1881. The following list of officers for the ensuing year was elected at the evening session: President, J. W. Dietrich, of Dayton; 1st Vice President, J. F. Judge, Cincinnati; 2d Vice President, H. C. Gaylor, Cleveland; Treasurer, Chas. Huston, Columbus.

Kentucky Pharmaceutical Association.—The third annual meeting of the Kentucky Pharmaceutical Association met in Owensboro' May 18th. The roll-call showed members were present from various portions of the State.

President Vincent Davis, of Louisville, delivered an address, showing that pharmacy is on the advance in this State.

The names of eight pharmacists were then presented by the Executive Committee and duly elected members of the body.

Out of eleven queries by the Committee on Notes and Queries eight were responded to. These will appear in the published Proceedings.

After the election of the following officers the Association adjourned, to meet in Louisville in May, 1881: M. H. Webb, President, Simpsonville; S. H. Ford, 1st Vice President, Owensboro'; Geo. H. Cary, 2d Vice President, Louisville; Henry McGill, 3d Vice President, Owensboro'; W. G. White, Recording Secretary, Richmond; C. S. Porter, Corresponding Secretary, Eminence; Peter Nodler, Treasurer, Covington.

The Pharmaceutical Society of New Zealand held meetings on the 4th of February and 2d of March, at which they determined to commence a library for the benefit of the members; to secure a stated place of meeting in Wellington; to urge the passage of a pharmacy act, and amend their charter in some particulars. The spirit that is thus shown speaks well for the interests of pharmacy in the future in New Zealand.

EDITORIAL DEPARTMENT.

State Pharmaceutical Societies.—Since our last issue four State Pharmaceutical Associations have held their annual reunions, and the interest shown in many of them augurs well for the cause of pharmacy. To have attempted the formation of such associations a few years ago would have been thought entirely unnecessary; and now there is scarcely a State where such a society is not either in progress of formation or being urgently called for by many of the craft.

The advantage that can and ought to accrue from these various State societies are many, but their realization will depend largely upon the wisdom and devotion of those who are the active workers in them. A few subjects that ought to claim their attention are the enactment of laws for the regulation of pharmacy where none such exist, and the amendment of those now in force where they are inadequate to the public or oppressive to those engaged in the practice of pharmacy. The co-operation of these various societies ought to be secured in an endeavor to modify the laws and rulings of the general government where they oppress the true liberty of those engaged in our business. This is, in fact, a duty which a body of men, possessed of proper self-respect, should require of the respective representatives in Congress. We have the right to claim the same respectful consideration and attention that any other class, equally respectable in education and general usefulness to the public, have almost always had accorded to them.

The reports of the various societies are noticed in this department of our Journal, and we would earnestly urge all our readers to use their best endeavors to increase the success and usefulness of these organizations.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Practitioners' Reference Book. By R. J. Dunglison, M.D.

That a second edition of a work of this kind and size should be demanded in three years is proof of considerable merit. It will be seen by a glance at a few of the subjects treated of that are mentioned below, how useful a volume it is, viz., weights and measures of the U. S. P.; the weights and measures of the metrical system; the relation these sustain to each other; the approximation of ordinary measures to metrical, metrical measures to fluidrachms.

Solubilities of medicines in the most used menstrua, abbreviations in common use among medical writers, and tables of specific gravity, posological tables, baths and their medication.

Incompatibles, with hints as to the best forms for different remedies to be prescribed in; tables of diagnostic signs of many diseases; rules for examination of urine; poisons and their treatment; directions for restoring persons apparently drowned; the hypodermic use of remedies; dietetic rules; and directions for conducting the last office of a physician on his patient, that of a post mortem. The above partial list will indicate how much that is valuable to physicians and pharmacists, and some that can be learned only by a great deal of reference, is contained in the treatise. The work is published by Lindsay & Blakiston in a style that is worthy of the reputation of the house.

Water Analysis for Sanitary Purposes. By E. Frankland, Ph.D., F.R.S. Presley Blakiston, 1012 Walnut street. 12mo, pp. 149. Price \$1.00

The well known experience of Dr. Frankland is a guarantee of the value of this treatise upon a subject that demands far more attention than it has received; that

everything which is in *daily* consumption should be free from noxious properties is too evident to admit of discussion, and the processes necessary to determine the suitability of water for potable use are so clearly explained that the decision is now no longer a matter of doubt if any intelligent person accustomed but slightly to qualitative analysis attends to the subject.

OBITUARY.

JOHN WILLIAM NEERGAARD died on the 25th of May, in New York, at the age of a little over 70 years, being one of the oldest and longest established apothecaries in that city.

Born on the 23d of April, 1810, at Copenhagen, Denmark, he became apprenticed to an apothecary in Bogeuse, passed the examination as assistant in 1828, and as apothecary in 1831. After having served as a clerk in Denmark and in Schleswig, then a Danish province, he established himself in business in Kjerterminde, on the Island of Fuehnen, in 1837; two years later he disposed of his business, and, in 1840, emigrated to New York, where he soon after his arrival opened a drug store in Pearl street, and kept it for fifteen years; during this time he attended lectures and graduated at the College of Physicians and Surgeons. In 1855 Dr. Neergaard went into partnership with his friend, Mr. John W. Shedden, at the corner of Bowery and Fourth street, New York city; three years later they opened a new store on the corner of Broadway and Twenty-eighth streets, which soon afterwards, by mutual agreement, was owned and conducted, to the end of his life, by Dr. Neergaard, and where for more than a quarter of a century he enjoyed the confidence and respect of the community.

Dr. Neergaard was a worthy representative man of his profession, and of that more and more disappearing generation of pharmacists who embraced pharmacy when it stood highest among the applied physical sciences and arts; the well-directed home and school education, the long and strict apprenticeship in the store and in the well appointed laboratory, with its rigorous but thoroughly instructive and fascinating application and patient methods, was the true and sole foundation of and highroad to his future proficiency and attainments. The high aims and principles, studious and persistent habits, the keen sense of duty contracted there, shaped for life his character and impressed upon it that sterling solidity and uncompromising integrity for which Dr. Neergaard was justly appreciated and respected.

A man of genial and retiring disposition, and of true modesty, he was strict in the performance of his duties, in the maintenance and elevation of the status and dignity of his profession, sincere in purpose and actions, and amiable to those whom he honored with his friendship. He scorned sophistry, ostentation and vanity, was an observer more than a talker, a man of large knowledge and ripe experience, which he well and usefully applied in his daily work during a long and active career; yet he never aspired to literary fame or public honors.

Dr. Neergaard joined the American Pharmaceutical Association in 1859, and was a member and honorary member of several pharmaceutical colleges and societies.

F. H.

THE AMERICAN JOURNAL OF PHARMACY.

AUGUST, 1880.

THE THALLEIOQUIN TEST.

BY CHARLES FREDERICK ZELLER.

(*From an Inaugural Essay.*)

This test, which is one of the most beautiful of the alkaloidal tests, was accidentally discovered by M. J. J. Andre, in 1835. He presented a memoir¹ to the College of Pharmacy of Paris, On the Action of Acid on Quinia, in which he endeavors to explain the cause of the fluorescence of quinia solutions, and then the action of chlorine on these solutions. He considered quinia to be a sort of resinate of ammonia, and in attempting to precipitate the resin, which he supposed to have been acted upon by the chlorine, by means of water of ammonia, he obtained a green precipitate, which was immediately redissolved by the liquid, and communicated to it a rich emerald color.

The name was probably derived from the Greek word "Thallos," meaning green, and quinia or chinin, the English and German words indicating the source from which obtained. As this action of chlorine water and ammonia upon quinia had often been spoken of on account of its extreme delicacy, and also of the influence of the presence of hydrochloric acid upon the delicacy of the test, the following experiments were entered into to determine these points. As both quinia and quinidia are similarly acted upon, solutions of both were used.

A. Solution of Sulphate of Quinia and fresh Chlorine Water.

1. Solution of sulphate of quinia (1 in 1,000) 100 grains, chlorine water 25 drops = 23 grains, liquor ammonia 1 drop = .8 grain, produced green color at once.

2. Solution of sulphate of quinia 100 grains, chlorine water 15 drops, dilute ammonia 1 drop, produced first a green color, then, by carefully

¹ "Amer. Jour. Phar.," 1836, p. 212.

shaking up the liquid, there was produced in its stead a beautiful rose color, which in the course of two hours assumed a brownish color, which changed in one week to light yellow.

3. Same as No. 2, and after rose color was produced a second drop of dilute ammonia deepened the color, third drop changed to dark green, and fourth drop a distinct emerald green.

4. Solution of sulphate of quinia 100 grains, chlorine water 10 drops, dilute ammonia 1 drop; same effect as in No. 2.

5. Solution of sulphate of quinia 100 grains, chlorine water 10 drops, dilute ammonia 1 drop, and then 3 more drops were added, which had the same effect as in No. 3.

6. Solution of sulphate of quinia 100 grains, chlorine water 5 drops, dilute ammonia 1 drop, produced green color, light at first, but deepens by standing.

7. Solution of sulphate of quinia (1 in 2,000) 100 grains, chlorine water 5 drops, dilute ammonia 1 drop, gives green color well, but does not change to rose color.

8. Solution of sulphate of quinia (1 in 4,000) 100 grains, chlorine water 5 drops, dilute ammonia 1 drop, gives a light green tint, which fades away in about twelve hours.

B. Solution of Sulphate of Quinidia and fresh Chlorine Water.

1. Solution of sulphate of quinidia (1 part in 1,000) 100 grains, chlorine water 25 drops = 23 grains, liquor ammonia 1 drop = .8 grain; same result as A 1.

2 and 3. Solution of sulphate of quinidia, chlorine water and dilute ammonia, same quantities and same results as A 2 and A 3.

4. Solution of sulphate of quinidia 100 grains, chlorine water 10 drops, dilute ammonia 1 drop, gave green color, did not change to rose.

5. Solution of sulphate of quinidia 100 grains, chlorine water 5 drops, dilute ammonia 1 drop, gave a distinct green color at once.

6. Solution of sulphate of quinidia (1 in 2,000) 100 grains, chlorine water 5 drops, dilute ammonia 1 drop; distinct green, lighter than B 5.

7. Solution of sulphate of quinidia (1 in 4,000) 100 grains, chlorine water 5 drops, dilute ammonia 1 drop, gave only a very light greenish-yellow tint.

The above experiments were performed in order to obtain the smallest amounts of chlorine water and ammonia which would take

part in the reaction; the proportions used by Brande¹ were: 1 grain sulphate of quinia in 100 grains of water, 200 drops of the aqueous solution of chlorine, recently prepared, and 10 or 20 drops of the solution of ammonia. This color is stated and was proven by experiment to be so intense that it can be diluted with twenty thousand parts of water and it will still retain an appreciable green tint. The proportions recommended in the Pharmacographia are: Solution of quinia, or one of its salts, 10 volumes, mixed with 1 volume of chlorine water, and then 1 drop of solution of ammonia is added; in solutions containing less than $\frac{1}{1000}$ of quinia no precipitate is formed. The last-mentioned proportions were tried, but did not produce a perfectly clear liquid. The method of performing the test was as follows: the alkaloidal solution was first poured into the test-tube, the chlorine water then dropped into it, care being taken that none ran along on the side of the test-tube, the drop of ammonia was then dropped into the centre of the liquid; the result was a slight reaction, with the production of white vapors, and a green layer on the top of the liquid, which was then shaken up. The first experiment with both sulphate of quinia and quinidia solutions caused the best and most permanent results, although much smaller amounts of chlorine water and ammonia gave the same results, as may be seen by experiment A 7; the color is not of the same intensity, becoming lighter as the alkaloidal solution decreases in strength. The liquid as thus obtained is of a beautiful emerald-green color, has a slight somewhat ammoniacal odor; by standing, an amorphous dark green substance is deposited, which is insoluble in ether, chloroform and benzin, but soluble in absolute alcohol; when heated it fuses and is decomposed, giving off white vapors having a disagreeable slightly ammoniacal odor. The thalleioquin solution when heated first darkens in color, and is then decomposed, becoming dark brown.

The experiments which now follow were performed in order to ascertain the effect of hydrochloric acid in chlorine water, tables C and D being given first as representing the most natural way in which acid would be present in chlorine water (by decomposition), the others being given to show the amount of acid which would prevent or modify the test. The chlorine water used in tables C and D was over one year old, had been kept in a dark place, in an amber-colored bottle, tightly

¹ "Amer. Jour. Phar.," 1839, p. 37.

corked with a rubber stopper, was nearly colorless, but still had the odor of chlorine; examined by the mercury test before mentioned, it gave an acid reaction with litmus solution.

C. Solution of Sulphate of Quinia and old Chlorine Water, sp. gr. 1.0012.

1. Solution of sulphate of quinia (1 in 1,000) 100 grains, chlorine water 25 drops, solution ammonia 1 drop, gave the emerald-green color.

2. Solution of sulphate of quinia 100 grains, chlorine water 15 drops, diluted ammonia 1st drop produced a green tint, and in a few seconds the solution was almost colorless and required 3 drops more dilute ammonia to bring back a pale green color. (No rose color was produced.)

3. Solution of sulphate of quinia 100 grains, chlorine water 10 drops, dilute ammonia 1 drop, gave a very slight yellowish-green; 3 drops of dilute ammonia were required to bring out the emerald color.

4. Solution of sulphate of quinia (1 in 2,000) 100 grains, chlorine water 5 drops, dilute ammonia 1st drop a very pale green; 4 drops were required to produce a marked green color.

5. Solution of sulphate of quinia (1 in 4,000) 100 grains, chlorine water 5 drops, dilute ammonia 1 drop, and then same as C 4, with same result.

D. Solution of Sulphate of Quinidia and old Chlorine Water, sp. gr. 1.0012.

1. Solution of sulphate of quinidia (1 in 1,000) 100 grains, etc.; same as C 1, with same result.

2. Solution of sulphate of quinidia 100 grains, chlorine water 15 drops, dilute ammonia 1 drop, produced first green, then a light rose tint, which deepened on standing.

3. Same as D 2; a second drop of dilute ammonia brought back green color.

4. Solution of sulphate of quinidia 100 grains, chlorine water 10 drops, dilute ammonia 1 drop, gave green color.

5. Solution of sulphate of quinidia 100 grains, chlorine water 5 drops, dilute ammonia 1 drop, produced a white precipitate.

6. Solution of sulphate of quinidia (1 in 2,000) 100 grains, chlorine water 5 drops, dilute ammonia 1 drop; same effect as C 4.

7. Solution of sulphate of quinidia (1 in 4,000) in same manner as C 4, with same result, the green which was produced being lighter than by D 6.

It will be seen, by looking over these tables, that as the amount of hydrochloric acid was increased the ammonia was proportionately increased also; for instance, fresh chlorine water without acid required 1 drop solution ammonia to produce the emerald-green color and this

Amount of Solution of Ammonia required.

	Old chlorine water.	5 per cent. acid.	10 per cent. acid.	15 per cent. acid.	25 per cent. acid.	50 per cent. acid.
Quinia solution, 2 drops		2 drops	3 drops	3 drops	5 drops	scarcely shows
Quinidia " "		"	"	"	"	precipitate

seems to prove that after a certain amount of acid has been neutralized the excess of chlorine bleaches out the color, forming a yellow solution, which turns to an amber-brown color if the acid be not present in too large a quantity.

As a matter of interest the bromine water test was tried, having been recommended as being more delicate than chlorine water. A saturated solution of bromine was made by dissolving 12 drops of bromine in 1 fluidounce of distilled water. It was found by experiment that 100 grains of sulphate of quinia or quinidia solution required but 5 drops of bromine water and 1 drop solution ammonia to produce a clear emerald-green color.

To sum up these experiments it may be stated, 1st. That the chlorine water for performing this test should be freshly prepared is not absolutely necessary, *provided* it is preserved in amber-colored glass bottles, tightly corked, and kept in a dark place. Chlorine water which had been kept in this manner over a year gave test color well, as seen in tables C and D. 2d. That hydrochloric acid, when added to *fresh* chlorine water, in quantities not exceeding 25 per cent., does not prevent its giving the test color, but will require a proportionately large amount of ammonia to neutralize the acid so added. 3d. That when hydrochloric acid is present in *old* chlorine water (the result of decomposition) it is due to the loss of chlorine so incurred, that the solution loses its value as a test liquid. 4th. It has been shown that bromine water is about four times more delicate than chlorine water, requiring but one-fifth to one-twelfth as much to produce the same results. 5th. On account of the simplicity and ease with which bromine water can be made, it is very much to be preferred as a means of performing the thalleioquin test.

ARALIA SPINOSA, OR FALSE PRICKLY ASH BARK.

BY LOUIS H. HOLDEN.

From an Inaugural Essay.

The striking difference of the physical characteristics between the barks of false and true prickly ash (*Xanthoxylum*) lies in the appearance of the spines and the fracture of the bark.

The former presenting spines which are quite numerous compared with the latter; they are about one-fourth inch in length, are smooth, slender and tapering to a fine point; their base is round or oval, and arranged in transverse rows.

The latter bark has few spines, scattered irregularly; they are straight and of the same length, but two-edged, with narrow linear base of about three-fourths inch in length.

The false bark breaks with a rather tough but nearly smooth fracture.

The true is brittle, and breaks with a short non-fibrous fracture.

In examining the bark the following is the result of my analysis:

Having reduced the drug to a coarse powder, it was moistened with alcohol and packed in a percolator, exhausted with alcohol, the alcohol was removed by distillation, and the residue evaporated to a solid extract. The extract was mixed with alcohol to the consistency of syrup, then treated with benzin, which removed the fatty matter; this fat is of a dark green color, which is probably due to chlorophyll. The residue was then treated with ether repeatedly, until the portion insoluble in ether, after being dissolved in water, would not answer the tests for tannin.

On examination, I find ether has removed from the extract all of the tannin and resin. Evaporating the ethereal solution to dryness and washing the residue with water, the tannin becomes separated from the resin.

The tannin is precipitated from aqueous solution by acetate of lead; it gives an emerald-green color with salts of iron; with caustic potash it turns ruby-red; the latter color, when acted upon by oxalic acid, is destroyed. The tannin coagulates albumen; it is an astringent, soluble in ether, alcohol and water. The alcoholic extract cannot be detannated with oxide of lead, which the following process will prove. The alcoholic extract was mixed with water; on adding to this oxide of lead, heating, allowing to stand for several days, then evaporating

slowly to dryness, mixing again with water and filtering, then adding fresh oxide of lead and allowing to stand for two months, it still answered to tests for tannin.

The residue from the etherial solution, after washing with water, was found to be resin. It is a brown opaque mass; powdered, it is of a light brown color, solid, brittle, fusible, and volatilized by a high heat; it is slightly acrid, soluble in alcohol and ether, insoluble in water, benzin and chloroform.

The residue from the alcoholic extract, after being treated with benzin and ether, is entirely soluble in water, from which it is precipitated by acetate of lead in the form of a heavy yellow adherent mass, which carries down mechanically the bitter principle; this can be separated by washing with alcohol. Upon evaporation, a lightish yellow substance, in scale, is obtained, which from the following experiments was proved to be a glucoside; to this the name of Araliin is given. Its solution has no effect on litmus. It is soluble in alcohol and dilute acetic acid, very soluble in water, foaming excessively upon agitation, and the froth being quite persistent; not soluble in benzin, chloroform or ether. Acetate lead has no effect upon its solution; no precipitate is produced by platinic chloride or bichloride of mercury; no action by nitric acid and chromate potash, nor does it answer to any of the tests for alkaloids. Hydrochloric acid bleaches the araliin, and develops the peculiar odor of the plant; the effect of sulphuric acid is similar. Potassium hydrate and ammonia have no effect.

Dissolve araliin in water acidulated with hydrochloric acid; upon boiling, a white, insoluble, tasteless and odorless precipitate is formed, for which I propose the name Araliretin. After filtering, testing filtrate for glucose by cupric sulphate and excess of caustic potash, and boiling, a heavy precipitate of red oxide of copper is formed, showing the bitter principle to be a glucoside. Araliin boiled with potassio-cupric tartrate produced precipitate of red oxide of copper, confirming the preceding test. When araliin is boiled with hydrate potash an amber color is produced.

Upon addition of tannic acid in cold solution no change takes place, but upon the application of heat a flocculent precipitate is formed.

EUPATORIUM PERFOLIATUM.

BY GEORGE LATIN, PH.G.

From an Inaugural Essay.

Eupatorium P. has been analyzed by Peterson (1851) and Bickley (1854); but, as they found nothing but the usual constituents of herbs, the writer thought it would be of some importance to make still further investigations.

The leaves and tops of the plant, reduced to a moderately fine powder, and packed in a percolator, were treated with 95 per cent. alcohol until exhausted. The alcohol was distilled off, and the residue evaporated to the consistence of an extract by a very gentle heat. This extract was then treated with ether, which dissolved out the bitter principle and coloring matter, leaving a grayish, gummy-like mass, entirely soluble in water, and proved, by Trommer's test, to be sugar.

The ethereal tincture was then placed in a flask, and the ether carefully distilled off by means of a water-bath, and evaporated to a semi-solid consistence, which was then treated with petroleum benzin, by means of which a large amount of coloring matter, fat, etc., was removed. The benzin solution, upon being permitted to evaporate spontaneously, yielded a number of small crystals in an impure condition, which adhered to the sides of the vessel. These were washed very rapidly with petroleum benzin and then with ether, which left them in the form of pure white needle-shaped tasteless crystals, and were insoluble in alcohol, ether, water and alkaline solutions. When treated with sulphuric and nitric acids separately no change was produced, but subjected first to the action of nitric and then with sulphuric acid a beautiful carmine-red was produced, changing after a short time to an orange-yellow; with hydrochloric acid a beautiful emerald-green, and with potassium bichromate with sulphuric acid a greenish-violet was developed. Heated to redness on platinum foil, no residue is left and no odor given off. The crystals have a comparatively low fusing point; on placing a few of them on a piece of note-paper, and holding them over the flame of a Bunsen burner, they melt, leaving a greasy stain, but not sufficiently strong to render the paper transparent.

This being, so far as the writer is aware, the first crystalline principle obtained from *Eupatorium P.*, it was a difficult matter to decide exactly what was the nature of the crystals, as the quantity was very

small; but, so far as examination enabled me to form an opinion, I judged them to be either wax or resin.

The residue left after treating with benzin was then dissolved in alcohol and filtered. Upon the filter there was left a black powder, which was unaffected by alcohol, water, alkalies and concentrated acids, and when heated was consumed, leaving an ashy residue.

The filtrate was then treated with an alcoholic solution of acetate of lead, which caused a copious precipitate of coloring matter; this was separated by second filtration, and the liquid treated with sulphuretted hydrogen (H_2S), by which the lead was eliminated. The liquid being boiled, was thus freed from sulphuretted hydrogen. After this, purified animal charcoal was left in contact with it for three days, the whole being shaken occasionally. By this means the solution was nearly deprived of color; it was then concentrated and treated with boiling water until all bitterness was removed, and the residue was a resinous, tasteless mass.

The aqueous solution thus obtained was again evaporated and treated with chloroform, which dissolved out a bitter principle and left a tasteless resin-like mass in the vessel.

The chloroformic solution, when evaporated, left the bitter principle in a pure condition, and was named Eupatorine. When tested by Trommer's test it gave no reaction, but when first boiled with sulphuric acid it gives a red-colored precipitate, and by sulphuric acid alone a white precipitate was occasioned, showing it to be a glucoside.

Eupatorine has a little acid taste, soluble in alcohol, chloroform, ether, boiling water and concentrated acids; with sulphuric acid a dark reddish-brown color is produced, and with hydrochloric and nitric acids a light yellow color results.

Eupatorine, when pure, is wholly dissipated by heat, and when boiled with sulphuric acid and water the odor of raspberries is given off.

Aqueous Percolate.—After the herb was treated with alcohol it was exhausted with water, and the solution evaporated to the consistence of an extract, having an astringent taste, and giving the following reactions: With ferric chloride, a dark-green color was produced; with solution of gelatin, a light brown precipitate was formed, and by placing this in a filter, and washing it with cold water several times, ferric chloride gave a dark color to that part of the filter that had been in contact with the precipitate, proving the presence of tannin; with tartar emetic, no precipitate. Alcohol gave a precipitate of gum from an

aqueous solution. Five grams of the herb, when exhausted with sulphuric ether, upon evaporating yielded an extract weighing 54 centigrams, having no bitter taste, and nearly all soluble in benzin, supposed to be coloring matter. A small quantity of volatile oil was obtained by distilling the herb with water, having the disagreeable odor of boiled cabbage. Five grams of the herb lose 37 centigrams of moisture when heated to dryness.

The chemical constituents of the herb are as follows:

Eupatorine (a glucoside), a crystallizable body, a volatile oil, gum, tannic acid, sugar.

ON IODOSULPHATE OF CHINIOIDIN AS AN EXCELLENT REAGENT FOR THE QUALITATIVE AND QUANTITATIVE DETERMINATION OF QUINIA.

BY DR. J. E. DE VRIJ.

Since my publication in the "Pharmaceutical Journal and Transactions" of December 11, 1875, p. 461, of a paper on this subject, my repeated application of the above mentioned reagent to the analysis of cinchona barks induced me to make some slight alterations in the process, so that it may now be useful to readers of this journal for me to publish my actual method of applying it. I am the more induced to make this publication, as recently an American chemist requested me to give him some information about the accurate estimation of quinia when it is mixed with a large amount of the other cinchona alkaloids.

Preparation of the Reagent.—One part of commercial chinioidin and two parts of benzol are heated together on a water-bath, whereby a solution of chinioidin in benzol is obtained. The clear solution is, after cooling, poured off from the insoluble part and agitated with an excess of diluted sulphuric acid, which, combining with the chinioidin dissolved in the benzol, yields a reddish-yellow solution of acid sulphate of chinioidin; to this clear solution, contained in a capsule, a solution of one part of iodine and two parts of iodide of potassium in 50 parts of water is *slowly* added with continuous stirring so that no part of the solution of chinioidin comes into contact with an excess of iodine. One part of iodine is required for two parts of chinioidin contained in the acid solution. By this addition an orange-colored flocculent precipitate is formed of iodosulphate of chinioidin, which either spontaneously or by a slight elevation of temperature collects into a dark brown-red colored resinous substance, whilst the supernatant liquor

becomes clear and slightly yellow colored. This liquor is poured off¹ and the resinous substance is washed by heating it on a water-bath with distilled water. After washing, it is heated on the water-bath till all the water has been evaporated. It is then soft and tenacious at the temperature of the water-bath, but becomes hard and brittle after cooling. One part of this substance is now heated with 6 parts of alcohol of 92 or 94 per cent. on a water-bath, and is thus dissolved, and the solution allowed to cool. In cooling, a part of the dissolved substance is separated. The clear, dark-colored solution is evaporated on a water-bath and the residue dissolved in 5 parts of cold alcohol. This second solution leaves a small part of insoluble substance. The clear solution obtained by the separation of this insoluble matter, either by decantation or filtration, constitutes the reagent which I have used since the beginning of 1875 under the name of "iodosulphate of chinoidin," both for the qualitative and quantitative determination of *crystallizable quinia*.

Application of the Reagent to the Quantitative Estimation of Quinia.—The mixed alkaloids obtained from any species of cinchona bark are treated with ether, the quantity of which depends on the amount of quinia contained in the mixture; 10 to 20 parts of ether will be found sufficient for the treatment of one part of mixed alkaloids. By this treatment the mixed alkaloids are divided [into] two parts, viz.: In a part soluble in ether and in a part insoluble in this liquid. The part soluble in ether contains chiefly quinia and amorphous alkaloid (chinoidin), besides traces of the other crystalline alkaloids. To estimate the quantity of quinia, one gram of the part soluble in ether is dissolved in 40 grams of acidulated alcohol of 92 or 94 per cent., containing 0.755 per cent.² of H_2SO_4 , to obtain an alcoholic solution of the acid sulphate of quinia. From this solution the quinia is separated by adding carefully, by means of a pipette, the before-mentioned reagent as long as a dark brown-red precipitate of iodosulphate of quinia (herapathite) is formed. As soon as all the quinia has been precipitated and a *slight*

¹ To prevent the use of an excess of iodine I have prescribed on purpose not enough iodine to precipitate all the chinoidin in the form of iodosulphate. Therefore the liquor contains still chinoidin which can be obtained in a very pure state if a little sulphurous acid is added before precipitating the alkaloid by caustic soda.

² This quantity is quite sufficient to transform the alkaloids into acid sulphates, and ought not to be increased, for an excess of acid would increase the solubility of the herapathite in alcohol.

excess of the reagent has been added, the liquor acquires an intense yellow color. The beaker containing the liquid with the precipitate is now covered by a watch-glass and heated on a water-bath till it begins to boil. After a night's standing, the beaker is weighed to ascertain the amount of liquid, which is requisite in order to be able to apply later a necessary correction. For, although the iodosulphate of quinia is very little soluble in alcohol, it is not absolutely insoluble,¹ and therefore a correction must be applied for the quantity which has been dissolved, both by the alcohol used for the solution of the alkaloids and the alcohol contained in the reagent. The liquid is now filtered to collect the herapathite on a small filter, where it is washed with a saturated solution of herapathite in alcohol.² After the washing has been completed, the weight of the funnel with the moist filter is taken and the filter allowed to dry in the funnel. As soon as it is dry the weight is taken again to ascertain the amount of solution of herapathite which remained in the filter, and which left the dissolved herapathite on the filter after the evaporation of the alcohol. This amount is subtracted from the total amount of the liquid, and for the remainder the correction is calculated with reference to the temperature of the laboratory during the time of the analysis. The dry iodosulphate of quinia is taken from the filter and dried on a water-bath between two large watch-glasses closing tightly upon each other, so that the weight of the substance contained in the glass may be taken without the access of the air. When, after repeatedly ascertaining the weight, it remains constant, this weight is noted down and to it is added the product of the calculated correction. The sum of this addition is the total amount of iodosulphate of quinia obtained from the part soluble in ether of the mixed alkaloids subjected to the operation, and from this weight the amount of *crystallizable* quinia can be calculated by the use of Jörgensen's formula, $4C_{20}H_{24}N_2O_{23}3H_2SO_4, 2HI, I_4$. According to this formula 1 part of iodosulphate of quinia, dried at

¹ Jörgensen found that at a temperature of 61°F. 1 part of alcohol dissolves, on an average, 0.00125 part of herapathite.

² For my bark analyses I always keep a supply of this solution, made by putting an excess of herapathite, dried at 212°F., into alcohol of 92 or 94 per cent. and shaking from time to time. The temperature of the laboratory in which the analysis is made is quite indifferent, provided that it is noted and does not change during the operation. It is clear that the amount of herapathite dissolved at *that* temperature in the alcohol must be ascertained, as this quantity varies with the temperature.

212°F., represents 0.55055 parts of pure anhydrous quinia, or 0.734 parts of pure disulphate of quinia.

Although I feel convinced that this process of estimating the amount of quinia in a mixture of cinchona alkaloids is not one which, *even in the hands of inexperienced persons, will give accurate results in a short time*, I have some hope that in the hands of experienced analysts it may prove a satisfactory one, if, before applying it, they study, as I have done, the action of the reagent upon solutions of 1 gram of quinia, quinidia, cinchonia and cinchonidia, each of them separately in 40 grams of the above-mentioned acidulated alcohol. If they do so they will find that the iodosulphates of quinia and of quinidia thus obtained have an analogous composition, and are identical with the compounds described by Herapath,¹ whilst the iodosulphates of cinchonia and cinchonidia have a different composition from the former, and both require more iodine to be transformed into the optical iodosulphates described by Herapath. In the meantime they will find that of all these iodosulphates, that of quinia is the most insoluble in alcohol, and is therefore precipitated the first of all and *alone* by a *judicious* addition of the reagent. Therefore the purity of the obtained iodosulphate of quinia can be easily tested by dissolving it in boiling alcohol and letting it crystallize by cooling. If the quinia-herapathite be really pure the mother-liquor will only be slightly lemon-colored, and if evaporated on water-bath 100 parts of the mother-liquor at 61°F. will leave not more than 0.125 parts of residue.

That the reagent can also be applied to test the commercial value of the various sulphates of quinia of commerce will be easily understood by carefully studying the process.

Soon after the first publication of my process in the "Pharmaceutical Journal" Prof. Jörgensen of Copenhagen published in "Journal für Praktische Chemie" a classical paper, "Ueber den sogenannten Herapathit und ähnliche Acid Perjodide," in which he describes not less than 7 crystallized compounds of quinia with iodine and sulphuric acid. The reading of this very elaborate paper not only explained to me the causes of the different results obtained by me by the addition of a solution of iodine to an acid solution of sulphate of quinia in alcohol, but induced me also to send a sample of my reagent to Prof. Jörgensen with the request to try it and to investigate the composition of the

¹ "Proceedings of the Royal Society," vol. ix, p. 10.

iodosulphate of quinia obtained by my reagent. He kindly informed me that *even 5 milligrams* of quinia were detected after 24 hours by the application of my reagent, and that the composition of the precipitated iodosulphate agreed to the formula $4C_{20}H_{24}N_2O_{21} \cdot 3H_2SO_4 \cdot 2HI, I_4$.

The Hague, July 5, 1880.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER, PH.D.

Inorganic Chemistry.—*Occurrence of Lakes of Sodium Sulphate in Russian Caucasus.*—In this district, in the neighborhood of the small town of Batalpachinsk, there are two lakes which cover considerable layers of sodium sulphate, and from which the salt is obtained in an almost pure state. The lakes have no exit; during the rainy season they fill up, and in summer their contents are partially evaporated. The sulphate contained in the water separates partly in consequence of cold weather, and is then gotten in layers of $\frac{1}{2}$ inch to 4 inches in thickness, which are called *Kruga* by the natives, and another part separates as a result of summer surface evaporation. Samples taken by Gauthier, and analyzed, showed that the dry salt contained 95 per cent. pure sulphate. According to a calculation of Gauthier, the water of these lakes should yield some 260,000 tons of the salt. A company has been organized in Paris to work this deposit systematically, and bring it to market.—*Chem. Indus.*, iii, p. 167.

Analysis of Virginia Rock Salt.—According to B. E. Sloan, the rock-salt of Saltville, Va., has the following composition:

NaCl,	89.21
KCl, .	trace
CaSO ₄ ·2H ₂ O,	4.86
Fe ₂ O ₃ ,	0.84
SiO ₂ ,	4.53
	<hr/>
	99.44

Strontium, barium and lithuim were absent.—*Chem. News*, vol. 40, p. 187.

On the Action of Caustic Soda upon Cast Iron.—It is a well-known fact that cast-iron vessels in which caustic soda has been repeatedly fused are gradually attacked, while there forms a porous, spongy mass. According to H. Brunk and C. Graebe, the walls of such vessels in which caustic soda has been heated for some time to a dull red-heat,

become affected to a depth equal to the thickness of a finger, the iron being changed into a friable mass, which consist essentially of dark bluish-violet crystalline scales. Two samples of these were found to consist of:

Ferric oxide,	. . . . .	88.01	87.92
Manganic oxide,	. . . . .	1.61	1.66
Water,	. . . . .	10.11	10.30

corresponding to the formula $H_2Fe_2O_4$.—*Ber. der Chem. Ges.*, xiii, p. 725.

Purification of Sulphuric Acid from Arsenic.—According to F. Selmi, sulphuric acid can be readily freed from arsenic if the sulphuric acid, diluted with half its bulk of water, be distilled after addition of some plumbic chloride. All the arsenic goes over with the first portions of the distillate as arsenic chloride.—*Ibid.*, p. 206.

Preparation of Phosphoric Acid.—Phosphoric acid may be readily prepared by covering a stick of vitreous phosphorus with water, adding a crystal or two of iodine and some nitric acid, and allowing the mixture to stand for 24 to 36 hours. After the oxidation is complete the solution is evaporated and treated as the Pharmacopœia directs. The advantages presented by this method are economy of material and consequent safety, and the indefinitely large quantities of phosphorus which can be oxidized by a very small quantity of iodine. The theory of the process is based on the discovery of Brodie ("Jour. Chem. Soc.," 1852, p. 289), that the iodine converts the vitreous phosphorus into the amorphous variety which is oxidized by the nitric acid. This method differs from that of Pettenkoffer, who treats phosphorus iodide with water, and obtains phosphorus acid which is oxidized by nitric acid.—*Phar. Jour. and Trans.* [3], 10, p. 468.

Preparation of Phosphates.—A great technical advance frequently carries with it minor improvements in its wake. Such is the case with the newly-devised process of the English metallurgist, Sidney Gilchrist Thomas, for dephosphorizing iron ores. The elimination of the phosphorus from the cast-iron in this process is effected by lining the furnaces with a very basic fire-brick, rich in magnesia. Thomas has just patented in England a process for recovering from the slags all the phosphate so formed. The slags are broken up and treated with hydrochloric acid. The filtered solution is then evaporated and the residue calcined at low temperatures to drive out the adhering hydrochloric acid, without decomposing, however, the ferric or man-

ganous chloride. The chlorides of iron, manganese and lime are then washed out with water, and the residue forms a concentrated basic phosphate.—*Ber. der Chem. Ges.*, xiii, p. 1150.

Organic Chemistry.—On Dynamite Gelatin.—This new and interesting compound consists of 86.4 per cent. nitro-glycerin, 9.6 per cent. of dissolved gun-cotton, and 4 per cent. camphor. Despite the large percentage of nitro-glycerin, it is distinguished by an unusual power of resisting heavy blows, and it requires for its explosive decomposition a cartridge of fulminating mixture, containing 15 to 20 grams of dynamite. Comparative experiments made in the St. Gothard Tunnel showed that the effective value of dynamite-gelatin was more than half as much again as that of dynamite No. 1. Thus, there proved to be of equal power: 1 part of dynamite-gelatin, 1.10 parts of nitro-glycerin, 1.50 parts of dynamite No. 1, 2.15 parts of dynamite No. 2 and 3, and 4.5 parts of ordinary powder.

Dynamite-gelatin, in contact with a burning body, burns like common dynamite without detonation. Two pieces of dynamite-gelatin maintained their full explosive power even after lying 12 days under water. A blow of 20,000 kilograms per square mm., struck by a steam hammer, did not produce an explosion, even when repeated six times; on the contrary, the gelatin began to burn.—*Chem. Industrie*, iii, p. 173.

Composition of Pyroxylin.—J. M. Eder has studied the properties of five cellulose nitrates.

Cellulose hexanitrate, $C_{12}H_{14}O_4(NO_3)_6$, is prepared by immersing dry cotton-wool in a mixture of 3 volumes of sulphuric acid (sp. gr. 1.845) and 1 volume of nitric acid (sp. gr. 1.5) at a temperature of 10° for 24 hours. The product is thoroughly washed with cold and finally with hot water. 100 parts of cotton yield from 175 to 180 of pyroxylin. The gun cotton contains from 1.2 to 5.8 per cent. of penta- and tetra-nitrate, which may be removed by repeated digestion with a mixture of ether and alcohol (3:1). The hexanitrate is insoluble in ether, alcohol, acetic acid, methyl alcohol, ethyl alcohol and ethyl acetate. Thoroughly washed gun-cotton may be heated at 100° for several days without undergoing any change; its temperature of ignition is between 169° and 170° . Attempts to prepare the hexanitrate by treating the cotton with nitre and sulphuric acid did not yield satisfactory results.

Cellulose pentanitrate, $C_{12}H_{15}O_5(NO_3)_5$, is formed together with the tetranitrate by digesting cotton-wool for five hours at the ordinary

temperature in a mixture of equal volumes of strong sulphuric and nitric (sp. gr. 1.4) acids. The product is washed and treated with ether to which a small quantity of alcohol has been added; in a few days a gelatinous mass is obtained, which is poured into three times its volume of alcohol, when the pentanitate separates out, leaving the lower nitrates in solution. The pentanitate can also be obtained by dissolving collodion-cotton in nitric acid (sp. gr. 1.4) at 60°; the turbid solution is cooled down to 0°, filtered through asbestos, and the filtrate is mixed with four times its volume of sulphuric acid (sp. gr. 1.84), care being taken to keep the mixture cool. The acid-liquid is then diluted and the precipitated pentanitate filtered and purified by solution in alcoholic ether and reprecipitation in water. This compound is insoluble in alcohol and in ether, but dissolves in ether-alcohol, in acetic acid and in ethyl acetate.

Cellulose tetra- and tri nitrates, $C_{12}H_{16}O_6(NO_3)_4$, and $C_{12}H_{17}O_7(NO_3)_3$, have not yet been obtained in the pure state. The tetranitate is insoluble in alcohol and in ether, but dissolves in methyl alcohol, ethyl acetate, alcoholic ether and in a mixture of acetic acid and alcohol, or acetic acid and ether. The trinitrate dissolves freely in ethyl-acetate, methyl alcohol and boiling acetic acid. It is slowly dissolved by absolute alcohol and the solution becomes turbid on the addition of ether in excess.

Cellulose dinitrate, $C_{12}H_{18}O_8(NO_3)_2$, is formed by the action of ammonia or potash on the higher nitrate. It is also prepared by adding alcoholic potash to collodion; the product is diluted with water and neutralized with acetic acid, when the dinitrate is precipitated. After being dissolved in alcoholic ether, it forms a yellowish-white powder which explodes at 175°. It is soluble in alcoholic ether, absolute alcohol, methyl alcohol, acetic acid, ethyl acetate and also in potash, but with partial decomposition. The solution in alcoholic ether deposits an opaque film on evaporation. The dinitrate appears to form compounds with alkalies, which are insoluble in alcoholic ether, but dissolves in water. The cellulose mononitrate could not be obtained.—*Ber. der Chem. Ges.*, xiii, p. 169.

On the Mydriatic Character of the Tropeins or Artificial Alkaloids.—We have noticed several times the work of Ladenburg on these interesting compounds (this journal, current vol., pp. 148, 198 and 367). Of the several tropeins, or compounds of tropin with acid radicals, *salicyl-tropein* did not dilate the pupil of the eye at all; *benzoyl-tropein* did have

mydriatic action, but in a lesser degree than atropin or hyoscyamin; while *oxytoluyt-tropein*, or because of its analogy to atropin, called *homatropin* by the author, possessed this power quite strongly.

The author has had it tested in the eye-clinics at the University of Kiel and reports more particularly upon its action. Although just about as energetic as atropin it acts much quicker, so that its effect passes off in 12 to 24 hours instead of 8 days as in the case of atropin. The homatropin is then much to be preferred in eye-clinics to atropin. Prof. Quincke has also found that homatropin is a much weaker poison than atropin, so that for this reason it is again to be preferred.—*Ber. der Chem. Ges.*, xiii, p. 1088.

ARALIA SPINOSA.

BY CHARLES WILLIAM ELKINS.

Extract from an Inaugural Essay.

The *Aralia spinosa* is a small tree cultivated to some extent in the Northern States for ornamental purposes, but is indigenous to the Southern States, where it often attains the height of from thirty to sixty feet. All parts of this plant are employed, particularly in the South, for medical purposes, but the bark alone is officinal in the United States Pharmacopœia.

I submitted the bark to an examination and obtained the following results:

A decoction of the bark, prepared by boiling a half ounce in eight fluidounces of water, gave, upon the addition of iodine to a portion of it, the characteristic blue color, denoting the presence of starch.

By Trommer's test glucose was detected in this decoction.

A portion of the decoction, after being acidified with muriatic acid, gave, upon the addition of a small quantity of Mayer's solution (iodohydrargyrate potassium), a white precipitate, thus showing the presence of an alkaloid; but this could not be obtained in a crystalline state, as will be shown presently.

There was also obtained from this decoction gum, which was precipitated from solution by subacetate of lead.

The absence of tannin was proven by appropriate tests, as was also albumen in the cold infusion, by not being coagulated upon being heated. In the hot infusion the same principles were found as in the decoction.

One hundred grains of the bark, exhausted by stronger alcohol, gave a rich, reddish-brown tincture, possessing an acrid taste. Upon the evaporation of this tincture there remained 18 grains (18 per cent.) of extract, which was insoluble in water, thus showing its resinous nature, and which possessed a very acrid taste.

About one third of this extract was dissolved when submitted to the action of ether, this part possessing a more acrid taste than the remaining portion.

The portion which was insoluble in ether was soluble in alkaline solutions.

The acrid taste of the bark, therefore, is due to two resins, which are very similar in taste to the resin obtained from Pellitory root. The bark contains pectin, which was obtained from the acid decoction by treating with milk of lime, when a large quantity of this substance was precipitated.

By the following process the bitter principle of the bark was obtained.

Four troyounces of the bark were exhausted, with successive portions of water and muriatic acid ; milk of lime was then added, which precipitated the pectin.

The filtrate from this was then evaporated to a syrupy consistence and a mixture of equal parts of alcohol and ether added. Upon the evaporation of the alcohol and ether the bitter substance was left in the form of a yellowish, semi-transparent mass. A small quantity of the mass was then dissolved in a little distilled water and the filtered solution set aside. On the evaporation of the liquid no crystals could be discovered in the residue.

It was, therefore, redissolved in water slightly acidulated with muriatic acid and again evaporated, when the mass was still found to be amorphous.

It was finally dissolved in water and the acid solution tested with the reagent for alkaloids (Mayer's solution), with the result of giving a very decided precipitate. I also succeeded in isolating this principle from the bark by the following process, which is somewhat different from the above :

Four troyounces of the bark were exhausted with alcohol and two pints of tincture obtained. This was evaporated to four fluidounces, an equal bulk of water added, which precipitated all the resinous matter.

The liquid was then filtered, and to the filtrate was added ammonia in excess, which changed it to a darker color.

Chloroform was then agitated with the ammoniacal solution in separate portions, being allowed to remain in contact each time for five or six hours, with frequent agitation, then separated and evaporated spontaneously, when a yellowish, bitter mass was left, similar to that obtained by the first process, and was soluble in water and ether.

It was dissolved in water acidulated with muriatic acid, filtered, evaporated and set aside, with the expectation that it would crystallize, but it refused to do so.

This principle, therefore, to which the bark owes its bitter property, seems to be an uncrystallizable alkaloid of some kind, which deserves more time and attention.

By distillation with water the bark yields a small quantity of volatile oil, which oil, therefore, gives to the bark its aromatic property.

By incineration the bark yields between three and four per cent. of ash.

The ash obtained from three hundred grains of the bark was digested in a half ounce of water and filtered.

To a portion of the filtrate a strong solution of tartaric acid was added, and at the end of an hour crystals of bitartrate of potassium were found to be present, proving the presence of potassium salt.

To another portion of the filtrate a solution of oxalic acid was added, which occasioned a white precipitate and refused to dissolve in an excess of acetic acid, thus proving the presence of calcium salts.

The organic constituents of the bark are starch, glucose, gum, pectin, two acrid resins, volatile oil and an alkaloid.

ERIODICTYON CALIFORNICUM.

BY WILLIAM C. HOLZHAUER.

(*From an Inaugural Essay.*)

The leaves, exhausted by stronger alcohol and then by water, yielded the following results:

1. The alcoholic percolate, evaporated to the consistence of an extract, yielded, by distillation with water, a small amount of volatile oil, lighter than water, of a pale straw color, aromatic taste and odor, but slightly resembling that of the leaves. The distillate was neutral

to test paper. On boiling the alcoholic extract with water and allowing the liquid to cool a crystalline substance of a yellowish-white color and of a feathery appearance deposited, destitute of taste and odor, insoluble in cold water and benzin, sparingly soluble in hot water (the solution having a slight acid reaction), very soluble in chloroform, ether and alcohol.

No alkaloids could be detected in the aqueous decoction.

The remainder of the aqueous decoction was then treated with a solution of acetate of lead, as long as a precipitate was thereby produced, then filtered. The precipitate, having previously been thoroughly washed with cold water, was then diffused through alcohol and decomposed by means of sulphuretted hydrogen, filtered, and the filtrate evaporated to dryness at a low temperature. The residue was a brittle substance of a light brown color, having an astringent, sour taste, proven to be tannin, the alcoholic solution of the tannin being perfectly clear, while that of the aqueous solution was turbid, and on the addition of ammonia or potassic hydrate turned to a dark brown color and became perfectly clear. The tannin gives a green precipitate with chloride of iron, acquiring a dirty appearance on standing.

2. Previously having treated the leaves with alcohol they were then percolated with water. The percolate was of a dark brown color, bitterish, astringent taste and having a slight acid reaction. After concentrating the percolate a part of it was treated with absolute alcohol, producing a precipitate of a dark brown color, wholly soluble in water, and proven to be gum associated with brown coloring matter. The presence of sugar was detected by means of Trommer's test.

No alkaloids could be detected. A portion of the percolate was then treated with a solution of acetate of lead as long as a precipitate was thereby formed. The precipitate, collected on a filter and thoroughly washed with water, was then diffused through alcohol and decomposed by sulphuretted hydrogen, filtered and the filtrate slowly evaporated to dryness by means of gentle heat. The product obtained was tannin, similar in appearance and corresponding in all its reactions to that obtained from the alcoholic percolate.

3. A fresh quantity of leaves was exhausted by ether.

The ethereal percolate was allowed to evaporate spontaneously to the consistence of syrup.

On boiling this with water a resinous mass was precipitated. The supernatant liquid was of a pale straw color, slight aromatic taste and

odor and of an acid reaction. Evaporating the supernatant liquid and allowing to cool crystals were obtained similar to those of the alcoholic extract, the quantity being too small to allow further investigation.

Examination of the Resinous Precipitate.

By treating with stronger boiling alcohol and allowing to cool a soft, greenish, waxy substance separated, forming a pellicle. This substance was freed from coloring matter by continued washing with cold alcohol. The residue was proven to be vegetable wax, possessing a slightly greenish tinge. After treating the resinous precipitate with boiling stronger alcohol there remained a soft, sticky substance, having neither taste nor odor, but slightly soluble in benzin and ether, readily soluble in chloroform, and from this solution was reprecipitated on the addition of alcohol, not volatile, burning with a sooty flame, which experiments prove its being identical with caoutchouc.

The remaining alcoholic liquid was of a dark green color; boiling, then digesting this liquid for 24 hours with animal charcoal, filtering, subsequently evaporating by gentle heat, a brittle resin was obtained of an amber color, aromatic, slightly bitter taste and faint odor.

PHARMACEUTICAL NOTES.

BY R. F. FAIRTHORNE, PH.G.

Benzoic Acid Pills.—Benzoic acid is one of those substances, of a class that, on account of difficult solubility in water, makes it desirable to find some method by which it can be administered without the disagreeable effect which follows each dose of the mixture when swallowed. The unpleasant effect referred to arises from particles of the acid adhering to the throat and palate, and remaining there for some time on account of partial insolubility. This difficulty can be avoided by giving it in the pilular form. Now, it so happens that some of my pharmaceutical friends have not been able to find a suitable excipient for making benzoic acid pills, and, having been applied to by one of them, I have tried a number of substances, and found two, either of which will make a good pill mass with that acid. They are balsam of fir and Castile soap. Of the former a few drops are sufficient to make a plastic mass with a drachm of benzoic acid; of the latter, I find that it requires 1 grain for 7 grains of the acid. Of course, a little water is added to the soap. By either of these means a perfectly satisfactory

pilular mass can be made. Some one may possibly object to the use of soap on account of soda present, forming benzoate of soda, but but when the small amount formed is considered the objection will be seen to be too trifling to notice.

Elixir of Valerianate of Ammonia.—

R	Ammonia valerianatis,	3iii gr. xii
	Syrupi,	f 3iii
	Alcoholis,	f 3i & 3vi
	Tr. cardam. comp.,	f 3iss
	Ext. aurantii cort. recentis,	f 3i
	Liq. ammonia,	q. s.
	P. cocci,	3i
	Aqua,	q. s. ut fiat f 3xii

The difficulty of making an agreeable elixir is owing to the fact that the valerianate is nearly always acid, and it is necessary that it be accurately saturated. This is accomplished by dissolving the salt in about 3 ozs of water and adding solution of ammonia, and determining neutrality by means of litmus paper, using both the red and blue paper. When thus neutralized it is filtered through paper or cotton, then the rest of the ingredients added, and again filtered.

To Deodorize Benzin.—If to each gallon of benzin 3 ozs. of powdered quick lime are added, and well shaken, a great deal of the peculiar sulphuretted odor will be removed, and articles that have been washed in it will have no disagreeable smell. This is no small advantage. The addition of freshly burnt charcoal may also be made with advantage.

Colors for Shop Windows.—A very beautiful amethystine color can be produced by dissolving 5 grains of salicylic acid in a little solution of ammonia, mixing this with two gallons or enough water to fill the show bottle. To this is added a few drops of solution of chloride of iron, and afterwards a few drops of muriatic acid.

Emerald-green color, of great beauty, can readily be produced by dissolving a few five-cent nickel pieces in equal parts of nitric acid and water, then diluting with sufficient water.

How to Purify Muddy Water.—The excessive muddiness of the water supplied to the inhabitants of this city, and the difficulty experienced in filtering it clear, led me to make several experiments, with the object of obtaining transparent water, free from impurities. After many fruitless or only partially successful efforts, I found the following

plan to succeed admirably, namely, to agitate each quart of water with an ounce of phosphate of lime, and allow it to settle. This only requires a few minutes, and it will be found that most of the impurities are carried down to the bottom. The supernatant water is now filtered without any trouble through absorbent cotton. Ordinary cotton will answer as well, if previously moistened with alcohol and then washed with water. Of course, either of them must be pressed tightly into the neck of a funnel. By this means perfectly clear water can be obtained in about five minutes.

A Good Filling for Teeth.—A filling that has been used very successfully for teeth, and which is next to gold leaf in permanency, is made of the following ingredients:

R	Oxide of zinc (recently made by burning),	200 parts
	Powdered silica,	8
	borate of soda,	4
	glass,	5

Mix and pass through a very fine sieve. To be kept in a well stoppered bottle.

When required for use, a little of the powder is mixed quickly with a concentrated solution of chloride of zinc, so as to make a thick paste, which is pressed into the cavity of the tooth, and will harden in less than ten minutes. It forms a hard white cement, which will last for years.

Cosmetic Pomade can be made by the following formula:

White wax,	4½ ozs. avoird.
Lard,	4¼
Balsam of Peru,	1 drachm
Oil of orange flowers,	30 drops
lavender,	5
cloves,	6
rosemary,	5

Melt the lard, wax and balsam, and stir them constantly until they thicken, when the oils are added. This is then poured into moulds; when cold, wrap up each stick in wax paper and tinfoil.

Black stick pomade is made by mixing 40 grains of best lampblack, carefully rubbed up with a portion of the lard.

Brown, by using burnt sienna in same way, and various shades of brown, by mixing burnt sienna with lampblack.

Camphoric Acid can be produced by boiling camphor with fifteen or sixteen parts of strong nitric acid, in a suitable glass vessel, for twenty

or twenty-four hours, when, upon cooling, the camphoric acid will be found floating on the top of the acid as a crystalline cake. This is removed and carefully washed with ice-cold water, when it will be found to consist of a mass of acicular snow-white crystals.

Camphorate of Ammonia.—This salt is easily produced by neutralizing camphoric acid with liq. ammonia fortior, evaporating by a very moderate heat until reduced to a syrupy liquid, and a pelicle begins to form, when it is set aside in a cool place to crystallize. It is a beautifully crystalline salt, consisting of masses of crystals, radiating from central points, arranged in the most symmetrical manner.

It is a salt that has sedative properties resembling the monobromide of camphor, but, unlike that compound, it is freely soluble in water. The dose is from 5 to 10 grains.

Elixir Protochloride of Iron.—Rabuteau's elixir having obtained considerable celebrity, I have made a substitute by the following formula :

Take of Protochloride of iron,	3 drs. 12 grs.
Glycerin,	4 fl. ozs.
White curacao,	12
Syrup,	4
Water,	sufficient to make 2 pints.

Mix an filter.

Waterproof Cement.—A good waterproof cement, suitable for mounting minerals, etc., and useful for aquariums, can be made by the following :

Take of Gutta percha, in chips,	4 ozs.
Brushmakers' pitch,	8
Shellac,	$\frac{1}{4}$

Melt in an iron capsule, on a sand-bath, and stir together. Pour out on a wet slab and roll into sticks.

ARIZONA SHELLAC.

At a recent meeting of the California Academy of Sciences Professor Stillman read a paper on the gum and coloring matter found on the *Acacia Greggii* and the *Larrea Mexicana* or creasote plant. The gum which exudes from these plants is very abundant, and is the product known to commerce as shellac. The same plants produce lac dye. Professor Stillman suggested that California might compete with British India in supplying this valuable product. Mr. B. B. Redding said that

these lac-yielding plants were as plentiful as sage-brush from Southern Utah to New Mexico, and from the Colorado Desert to Western Texas.

The lac is most abundant around stations on the Mojava and Colorado deserts, and exudes as the result of an insect's sting. Calcutta exports a million pounds sterling in value annually of shellac, selling at 25 to 35 cents a pound, and almost as much more of lac dye, selling at 30 to 40 cents a pound. In 1876 the United States imported 700,000 pounds of shellac alone. To collect this is simple work for boys, and will prove an important industry. It will require little or no capital. The twigs are boiled in hot water and the gum rises to the top, is skimmed off, strained and dried on smooth stones and hand-pressed into flakes, ready to make sealing wax or varnish. The residue, when allowed to settle, makes lac dye. The plants live on a rainfall of three inches a year.

In vol. vi (Botany) of the Reports of the U. S. Geographical Surveys west of the 100th meridian we find the following information relative to these two plants, which would seem to be worthy the attention of commercial men and manufacturers:

P. 108—"Acacia Greggii, Gray.—A small tree, 10 to 20 feet high, pubescent or glabrous, unarmed or with scattered stout recurved prickles; pinnæ 2 or 3 pairs; on a slender petiole; leaflets, 4 to 5 pairs, oblong or oblong-ovate, 2 or 3 lines long, rounded or truncate above, narrower at base, rather thick and with 2 or 3 straight nerves; flowers in cylindrical spikes an inch or two long, the peduncles equaling or exceeding the leaves; pods thin, coriaceous, flat, 3 or 4 inches long by 5 to 7 lines broad, shortly stipulate, acute, curved, glabrous and reticulated, more or less constricted between the seeds; seeds half an inch long. From Western Texas to Southern California; collected in Western Arizona, 1872."

P. 41—"Larrea Mexicana, Moricand, *creosote bush*.—Common from Western Texas to Kern county, California, and southward to Mexico. Dr. Loew's examination proves that the reddish-brown exudate on the branches, caused by an insect, will yield a red coloring matter showing all the reactions of cochineal. 'The alcoholic extract of the leaves, on evaporation, yields a greenish-brown residue, of a specific and somewhat disagreeable odor, more strongly perceptible on boiling the extract with water. This residue is only to a small extent soluble in water, and the solution has an acid reaction. It yields a light yellow

precipitate with acetate of lead. The part of the alcoholic extract that is insoluble in water is easily soluble in alkalies. It also dissolves in nitric acid at a moderate heat, whereby oxidation takes place. On addition of water a yellow, brittle mass is precipitated.' The Mexicans are said to use an infusion of the leaves for bathing in with good effect in rheumatic affections." (Also vol. iii, Wheeler's Reports)

P. 80—"Larrea Mexicana, Moric (*L. glutinosa*, Englemann), Valley of the Gila, Arizona.—This shrub is especially common on the hills bordering the Gila, also on the sandy wastes adjacent to Tucson and Camp Lowell, in Arizona, even imparting its strong odor to the air."

In the third volume of these reports this plant is also called stink-weed and etiontio.—*Scientific American*, April 10, 1880.

CHIAN TURPENTINE.

BY WILLIAM MARTINDALE.

This drug, the oleo-resin from *Pistacia terebinthus*—having until lately fallen into desuetude—since the appearance in the "Lancet"¹ of an article recommending its use in cancer of the female generative organs has been much in request. Owing to the small demand for it very little has of late years come into the market, and it has been stated that much of what has been supplied to the trade is factitious. There is little doubt, with the demand now created, plenty of the genuine article will be forthcoming in time.

The history of its use in medicine seems to be lost in antiquity. It was always more prized by the Greeks than the pinaceous oleo-resins. It has principally been obtained from the Island of Scio; here, as well as on the other islands of the Archipelago, Cyprus, Asia Minor and Syria, the tree is cultivated, and flourishes to the greatest perfection. It attains the height of 40 feet or more in favorable localities, but in others it grows as a stunted, straggling shrub, and is found as far east as Afghanistan and west as the Canary Islands. The yield of the oleo-resin from a tree 4 or 5 feet in circumference is only about 10 or 11 ounces yearly. A great part of it exudes spontaneously, but more of it is obtained by making incisions into the trunk and branches in the spring, from which the turpentine continues to flow during the whole summer. It is collected in the morning, after the coolness of the

¹ "Lancet," vol. i, 1880, p. 477.

night has somewhat solidified it, from the stem and flat stones placed at the foot of the tree to receive what may have run down.

Chian turpentine has been omitted from the British Pharmacopœias, but was official in the London Pharmacopœias. Royle states that it used to be taken chiefly to Venice, where it was in request for making the far-famed Theriaca. Pereira, Guibourt and Hanbury describe it, and their descriptions are rather conflicting. It has a very firm, honey-like consistence, yet is slightly brittle and becomes more so with age and exposure to the air, and even then it always takes the form of the vessel in which it is kept. It is translucent; small pieces appear yellow or brownish-yellow, but in mass it has a greenish-brown color. It has when fresh a distinctive odor, slightly like the pinaceous turpentine, but much more agreeable and aromatic, according to some resembling citron and jasmine; but there is always a background smell like that of mastic, which becomes more developed and distinct with age, when it has lost the more volatile portion, the essential oil. According to Pereira the turpentine-like odor is combined with the odor of fennel, and Guibourt says, when kept in a covered glass vessel the odor is strong and agreeable, analogous to that of fennel or the resin of elemi. It probably loses this rapidly. A specimen, bearing Guibourt's name, in the Society's Museum has now no trace of it, but the mastic odor is very persistent. If the fennel odor be very evident in it I should fear the sample was not genuine, as in a statement made in the "*Lancet*"¹ the writer says what is sold as Chian turpentine "is either greatly adulterated or a wholly factitious article, manufactured from black resin, Canada balsam and the essential oils of fennel and juniper." The taste of genuine Chian turpentine resembles that of mastic; it is agreeable and free from the characteristic bitterness and acidity of the pinaceous turpentine.

From its mode of collection even the genuine Chian turpentine is always contaminated with impurities, earthy dust, etc. Testing a number of what I have reason to believe are genuine samples, as well as some not genuine, I find they are all (mechanical impurities excepted) entirely soluble in ether and absolute alcohol. Still the genuine oleoresin, as stated by Guibourt, leaves a little glutinous resin undissolved when treated with alcohol slightly diluted (I used rectified spirit, sp. gr. .838); yet this can scarcely be identical with the beta-resin or masticine of mastic, which is left undissolved when mastic is treated even

¹ "*Lancet*," vol. i, 1880, p. 541.

with absolute alcohol. The alcoholic solution of Chian turpentine reddens litmus paper. The pimaric acid of Canada balsam is not soluble in cold absolute alcohol, but admixture with other ingredients might render it so. I am unacquainted with any definite test for its purity.

In judging of its genuineness we must rely on its taste, odor and physical characters, as above described. It should, more especially, be not too fluid. The drug was considered by Dioscorides to be diuretic, stomachic and laxative.

In administering it for cancer (an application of it Mr. Tweedy has shown to be not new,¹) three formulas have been employed by Professor Clay: Pills, ethereal solution and an emulsion made from the latter. The pills consist of 3 grains of Chian turpentine and 2 grains of sulphur in each. Sulphur is a novel excipient and not a very good one, as the pills lose their shape. The excipient generally used and recommended in books for the purpose is calcined magnesia. Three grains of Chian turpentine and $1\frac{1}{2}$ grain of light magnesia make a pill which retains its shape tolerably well; but it is perfectly indigestible, barely losing one-tenth of its weight in passing through the body.

Some years ago² I was asked to prepare tar in a pilular form. The excipients mostly used for this—light magnesia and beeswax—have both the disadvantage of making the pills indigestible, and knowing the peculiar action lycopodium has of absorbing these oleo-resins I succeeded in making a very good pill with 2 parts of tar and 1 of lycopodium. I at the time also made some pills with 2 parts of American turpentine and 1 part of lycopodium, which kept their shape. Chian turpentine, although harder, I find requires a little more lycopodium to enable the pills to keep their shape; 3 parts with 2 parts of the powder make fairly good pills, but these also are not digested. Sugar is a no better excipient than sulphur in enabling the pills to retain their shape. The sulphur pills are digested, and perhaps no better formula can be devised. With any excipient the pills should not be made too hard. I have seen some pills of Chian turpentine coated which retained their shape well; but I should be inclined to doubt their digestibility.

The other formula used is an ethereal solution of 1 ounce of Chian turpentine dissolved in 2 fluidounces of absolute ether, the

¹ "Lancet," vol. i, p. 582.

² "British Medical Journal," vol. ii, 1875, p. 498.

resulting solution measuring slightly over 3 fluidounces, and an emulsion is prepared from this as follows :

R	Ethereal solution of Chian turpentine,	fl. ℥ss.
	Solution (mucilage) of tragacanth,	fl. ℥iv.
	Syrup, .	fl. ℥i
	Sublimed sulphur,	grs. 40.
	Water, .	to fl. ℥xvi.
Mix.		

The sulphur appears to have been added because it was not wished to lose anything contained in the pills which had previously been proved to be of such service. Mix it as you will, the sulphur will separate from such a mixture and aggregate the resin in masses, first to the top and then at the bottom of the bottle. By using mucilage of acacia in place of mucilage of tragacanth a satisfactory mixture may be obtained by first putting the mucilage into the bottle, adding the turpentine solution, shaking and diluting with a little water; rub the sulphur with the syrup and pour into the bottle; fill up gradually with water, shaking after each addition of a little; or a good emulsion can be made, using either mucilage of tragacanth or mucilage of acacia, by omitting the sulphur altogether. This, as pharmacists, we are not warranted in doing, but the substituting of mucilage of acacia for mucilage of tragacanth is a deviation from the strict letter of the prescription which, with the leave of the prescribers, I have had recourse to.—*Pharm. Jour. and Trans.*, April 24, 1880.

THE PRODUCTION OF INDIGO IN BENGAL.¹

Indigo is almost entirely obtained from leguminous plants of the genus *Indigofera*, that cultivated in India being the *Indigofera tinctoria*, and that in America the *Indigofera anil*. The plant is grown in India, China, Java, the Antilles and Central America. It is planted either in the spring or the autumn, and generally in clayey soil. In India it has pinnate leaves and a slender ligneous stem, and, when successfully cultivated, rises to the height of 3, 5 and 6 feet. It is cut with pruning knives at the end of May, and as its growth is exceedingly rapid, two, and sometimes three crops are obtained, but the last crop, in its production of coloring matter, is not equal to the first. Mr. Kœchlin-Schwartz, in an article in the "Bulletin de la Société Industrielle de

¹ From the "Journal of the Society of Arts," April 30, 1880.

Mulhouse," gives some interesting particulars of the preparation of indigo in Bengal.

In this province of India, the indigo factories—in addition to filters, presses, a boiler, drying grounds and reservoirs—are provided with two rows of vats, each consisting of 15 to 20. These vats are constructed of brick-work, and covered over with a strong coating of stucco; they are generally from 18 to 20 feet square, and about 3 feet deep; the back row is nearly three feet higher than the front, and it is in the higher row of vats that the fermentation takes place. When the fermentation is completed, the liquid is turned off, and flows into the lower vats. The water of the Ganges, which is comparatively pure, and therefore well adapted for the purpose, is utilized in this process.

In the morning the plant is cut, taken to the factory, and loaded in the vats in the evening, one vat containing 100 packages or bundles, arranged in layers, on the top of which are placed transverse pieces of wood tightly wedged down, it being necessary that the plants should be well pressed, or the fermentation would not otherwise thoroughly take place. Water is then allowed to flow into the vats until the plants are submerged. The process of fermentation lasts from nine to fourteen hours, but depends entirely upon the temperature. To test the progress of the operation, a little of the liquid is drawn off into the lower range of vats; if it is of a pale straw color, the quantity produced will not be so abundant, but it will be of a superior quality than when the color is of a deeper yellow tinge. The color of the liquid after fermentation, and when it is drawn off, is always more or less of a deep yellow. It is allowed to remain some little time, then the water, while still warm, is beaten by twelve naked men armed with long bamboos. While this is going on, the higher range of vats is being emptied and cleared for another supply of the plants, seventeen workmen being employed in cleaning one vat. The liquid is beaten for two or three hours, and gradually becomes a pale green color, and the indigo forms into small flakes; it is allowed to remain half an hour, and the water is then turned off gently, corks placed at different levels in the vats, being one by one withdrawn. The water returns to the river, and the deposit, which resembles a thin scum, is carried through a trough into a deep trench. By means of a hand-pump, it is then brought up and boiled for a short time in order to prevent a second fermentation—which would cause it to turn black and be spoiled. It is allowed to remain about twenty hours, and then the boiling process

is again resorted to, which continues for three or four hours, when the boiling mass is poured off and strained through a filter. This filter is composed of a brick vat covered with stucco, 18 to 20 feet long, 6 feet wide, and about 3 feet deep; it is covered with bamboos, on which are spread rush mats, and over these a strong, well stretched linen cloth. On this cloth, after the liquid has been strained through, there remains a thick, deep blue paste, almost black.

The water which was in the vat, in flowing through the filter, leaves this deposit of indigo. The paste is then placed in small, solidly constructed wooden cases, perforated with small holes, and with a very strong linen cloth at the bottom; the cases are then covered with cloth, and a wooden lid perforated also with small holes; they are then pressed in a vise to extract every particle of moisture. When this operation is completed, the indigo is found in a large thick block, the cutting of which demands careful attention, and must be done very slowly. The blocks are then submitted to the action of the drying-ground, which consists of a large brick building of a good height, with windows furnished with closed lattices to exclude the rays of the sun, even thick bushy trees being planted all round the buildings to assist in keeping out the light. The cakes occupy from three to five days in drying, and are then sent to Calcutta. It is in this state that indigo is delivered into the market; its quality may be tested by its lightness or small specific gravity, and its bright color when rubbed with the nail. —*Pharm. Jour. and Trans.*, May 15, 1880.

THE ALKALOIDS OF POMEGRANATE BARK.¹

BY C. TANRET.

In March, 1879,² the author announced that in pursuing his chemical investigation of pomegranate bark he had established the fact that pelletierine, the alkaloid previously isolated by him, is accompanied in the bark by three other alkaloids, two of which, like pelletierine, are liquid and one is crystallizable, all four being volatile. In the present communication the author describes the principal properties of these alkaloids and the method adopted by him for their separation.

In the first place a mixture of the salts of the alkaloids is prepared

¹ "Comptes Rendus," vol. xc, p. 695.

² "Comptes Rendus," vol. lxxviii, p. 716.

by mixing the powdered bark with a milk of lime, exhausting with water, shaking the resulting liquor with chloroform and neutralizing the latter with dilute acid. A solution of the mixed alkaloids is thus obtained in which one or other of them predominates, according to the source of the bark. Two of the four alkaloids are displaced from their salts by bicarbonate of soda and two are not. This solution is therefore treated with an excess of bicarbonate of soda and shaken with chloroform, and this in its turn is agitated with dilute sulphuric acid. The resulting solution contains the sulphates of two alkaloids, to which the names of "methylnelletierine" and "pseudonelletierine" have been given. Caustic potash is then added to the first liquor, and upon repeating the treatment with chloroform and acid there is obtained a solution of the sulphates of "nelletierine" and "isopelletierine."

Methylnelletierine.—In isolating this alkaloid the author has adopted a method of fractional saturations. The mixture of sulphates obtained by treatment with bicarbonate of soda is partially decomposed by an alkali, then shaken with chloroform, and this afterwards with an acid. The methylnelletierine is concentrated in the first portion set free, and after this treatment has been sufficiently repeated a point is reached at which the rotary (dextro) power of the product is no longer augmented, and the salt so produced the author considers to be pure. To obtain free methylnelletierine a concentrated solution of one of its salts is decomposed by an alkali, and the alkaloid liberated is dehydrated over fragments of potash and distilled in a current of hydrogen.

This alkaloid is liquid. Analysis of its hydrochlorate, which has a rotatory power of $\alpha_d = + 22^\circ$, gave results corresponding with the formula $C_{18}H_{34}N_2O_2$. It dissolves in twenty-five times its weight of water at $12^\circ C.$, is very soluble in alcohol, ether and chloroform, and boils at $215^\circ C.$

The salts of methylnelletierine are extremely hygrometric.

Pseudonelletierine is a crystalline alkaloid, and is obtained by concentrating the liquid from which the methylnelletierine has been removed, treating it with caustic potash and shaking with ether. Upon evaporation of the solvent crystals are left, which can be obtained quite pure by repeated recrystallization. The composition of this alkaloid is represented by the formula $C_{18}H_{30}N_2O_2$.

Nelletierine.—The solution of sulphates obtained by the action of caustic alkali is evaporated over sulphuric acid, and when the residual mass is dry it is exposed to the air upon folds of blotting paper. It

soon partially deliquesces, leaving on the surface of the paper scarcely hygrometric crystals, consisting of sulphate of pelletierine. The salt which penetrates the paper, and which, if care be taken at the time to prevent its exposure to the air, has no rotatory power, is the sulphate of isopelletierine.

The pure alkaloid is obtained by the same process as methylpelletierine, the precaution being used of distilling at a low pressure, ebullition at the ordinary temperature altering it rapidly.

Pelletierine is a liquid and colorless alkaloid when just obtained in a current of hydrogen, but it is remarkable for the rapidity with which it absorbs oxygen and resinifies. Its density at zero is 0.988. Analyses of its chloroplatinate and hydrochlorate lead the author to assign to it the formula $C_{16}H_{30}N_2O_2$. The alkaloid is soluble in the cold in twenty times its weight of water, of which it dissolves its own weight. It is soluble in all proportions of ether, alcohol and chloroform. At the ordinary pressure it boils at $195^{\circ}C$., distilling then with partial decomposition. Under a pressure of 10 centimeters the boiling point is lowered to $125^{\circ}C$.

Sulphate of pelletierine has a rotary power of $\alpha_d = -30^{\circ}$. If the free alkaloid be heated to 100° the rotatory power disappears.

Salts of pelletierine lose a portion of the base when heated either dry or in solution.

Isopelletierine is isolated in the manner just described. It is a liquid alkaloid, without action upon polarized light. Analysis of the hydrochlorate gave results corresponding to the same formula as pelletierine, of which it may be considered an isomer. Its density, solubility in water and boiling point are the same as those of pelletierine.—*Pharm. Jour. and Trans.*, April 17, 1880.

NOTES ON INDIAN DRUGS.

BY W. DYMCK.

CURCUMA Sp.? AMOMACEÆ. *The rhizome.* Vernacular: AMBEHALDI, JANGLI-HALDI (Hind., Beng, Bomb.); KASTURI-MANJAL (Tam.)? KATTU-MANNAR (Malay)?

History, Uses, etc.—This rhizome is the *zêdoaire jaune* of Guibourt, who tells us that the plant which produces it has been well described and figured by Rumphius. It is his *Tommon bezaar* or *Tommon primum*, which has been wrongly referred by most writers to the *Curcuma*

Zedoaria of Roscoe (Confer. Guibourt, "Hist. Nat.," 6ème éd., tome ii, p. 214). It would appear also that it is identical with the cassumunar described by Pereira and the turmeric colored zedoary of Ainslie. (Confer. Pereira, "Mat. Med." vol. ii, part i, p. 236). Lastly it would appear to be the same as the Cochin turmeric noticed by Flückiger and Hanbury ("Pharmacographia," p. 580). The properties of this drug are very similar to those of turmeric, but its flavor is not so agreeable; in Bombay it is used medicinally in combination with other drugs as an external application to bruises, sprains, etc.

The plant grows wild in the Concan. I have not seen it in flower. The foliage is like that of the *C. Zedoaria*, Roscoe, pale yellowish-green with a purple stain down the midrib of the leaf. A good deal of the drug is sent from Bombay to Europe, where it appears to be used as zedoary. A European chemists' firm in Bombay, writing home for zedoary root, was supplied with this article. The name cassumunar is probably a corruption of the Malay Kattu-mannar.

Description.—Central rhizome oblong or conical, often more than two inches in diameter; external surface dark grey, marked with circular rings and giving off many thick rootlets; lateral rhizomes about as thick as the finger, with a few fleshy rootlets; at the ends of some of the rootlets are orange-yellow tubers about the size and shape of an almond in its shell. Internally the central and lateral rhizomes are of a deep orange color like turmeric. The odor of the fresh root is like turmeric, but more camphoraceous.

Microscopic Structure.—Similar to that of turmeric.

Commerce.—The Bombay market is supplied from the Malabar coast. Value, unpeeled Rs. 24 to 25 per kandy of $5\frac{1}{4}$ cwt.; peeled Rs. 24 to 27. I have the plant in cultivation, but it has not yet flowered. Can it be the *C. zanthorrhiza* of Roxburgh?

CURCUMA AROMATICA, *Salis.* AMOMACEÆ. *The rhizome. Vernacular:* KACHOORA (Hind., Beng., Bomb.).

History, Uses, etc.—This plant affords the round zedoary of Guibourt, which he tells us is the zerumbet of Serapion, Pomet and Lemery. The following is his description of the drug: "The round zedoary is greyish-white externally; heavy compact; grey and often horny internally, having a bitter and strongly camphoraceous taste, like that of the long zedoary, which it also resembles in odor. The odor of both drugs is analogous with that of ginger, but weaker unless the rhizome be powdered, when it develops a powerful aromatic odor similar to that of

cardamoms" ("Hist. Nat.," 6ème éd, tom. ii, p 213). The round zedoary is one of the two zurambáds (zerumbets) described by Mahometan writers, the other being the nar kachoorá of India, which does not appear to be known in Europe.

Description.—Guibourt's description already given agrees exactly with the kachoorá of India, but it is often cut into transverse slices instead of into halves and quarters.

Microscopic Structure.—This is essentially the same as that of turmeric, but the resin and essential oil in the cells are of a yellowish-white color, and the greater portion of the starch grains are ovoid or pyriform instead of narrow and elongated as in turmeric.

Chemical Composition.—Zedoary contains, according to Bucholz ("Répert Pharm.," xx, p. 376), volatile oil, a bitter soft resin, a bitter extractive matter, gum, starch, etc. The oil is turbid, yellowish-white and viscid, has a camphoric taste and smell, and consists of two oils, one lighter, the other heavier than water. Trommsdorff obtained from the root a substance which he called zedoarin, but did not further describe it (Watt's "Dict. of Chem.," vol. v, p. 1066).

Commerce.—The Bombay market is supplied with Kachoorá from the Madras Presidency. Value, Rs. 20 to 30 per kandy of 7 cwt.

CURCUMA Sp. AMOMACEÆ. *The rhizome.* *Vernacular:* NAR-KACHOORA (Hind., Bomb.).

History, Uses, etc.—This drug is one of the two zurambáds of Arabic and Persian writers on materia medica and the nar-kachoorá of India. Strange to say it is not noticed by recent writers on Indian materia medica, though it is a well-known drug and to be found in all the shops. Meer Muhammad Husain states that the plant blossoms from the centre of the leaves like turmeric, which it also resembles in foliage. Can it be the *C. viridiflora* of Roxburgh and tommongiring *seu* giri of Rumphius (Amb. 5, 169)?

Description.—The drug consists of small globular central tubers, from which spring numerous lateral rhizomes about the size of the little finger. It is of a dark grey color externally and marked with circular rings; internally it is very hard and horny, of a greyish-orange when cut in thin slices; odor camphoraceous, taste bitter and camphoraceous.

Microscopic Structure.—The minute structure of this rhizome hardly differs from that of the zedoary. The starch contained in the parenchyme cells has been altered by heat and appears as a finely granular mass nearly filling the cell. The resin cells are about as numerous as

in the zedoary, but the contents are of a dull orange color. The vascular system consists of scalariform and spiral vessels, most numerous at the junction of the central and cortical portions of the rhizome.

Commerce.—This drug is said to reach Bombay from Cawnpore. Value, Rs. 4 to 5 per maund of 41 pounds.

ALPINIA OFFICINARUM, *Hance*. AMOMACEÆ. *The rhizome. Vernacular:* CHOTA-KULIJAN, CHOTE-PANKI-JAR (Hind., Beng., Bomb.); SHITTA-RATTAI (Tam.).

History, Uses, etc.—Although this drug has been long known its botanical source was only discovered in 1870, when a description of the plant was communicated to the Linnean Society of London by Dr. H. F. Hance, made from specimens collected by M. E. C. Taintor near Hoihow in the north of Hainan (Confer. "Journal of the Lin. Soc.," 1873, xiii, p. 6). Galangal is not much used in Hindu medicine. In Sanskrit works it is called "khulinjāna," evidently a corruption of the Arabic khulanjān. Mahometan writers suggest that the drug may be the root of very old plants of *Piper Betle*, but they are evidently in doubt about its being produced by that plant (Confer. "Makhzan," article "Khulanjān"). Meer Muhammad Husain describes galangal as tonic, stomachic, carminative, stimulant and aphrodisiac. He tells us that if given to young children it makes them talk early, and that a paste of the powdered drug made with oil or water will remove freckles. The Persian name is khusrodāru. Galangal is one of the ingredients of Warburg's tincture. It is not used in English medicine, but there is a considerable demand for it in Russia. Irvine ("Med. Topog. of Ajmeer," p. 171) says that the natives add kulijān to bazar spirit to make it more intoxicating.

Description.—The dried rhizomes are about as thick as the little finger or often less. They have evidently been cut into short lengths (2 to 3 inches) while fresh; many of the pieces are branched, and all are marked by numerous circular ridges of a light color. The external surface of the rhizome is of a deep reddish-brown; the interior pale red, hard and tough; the odor is aromatic and the taste hot and spicy.

Microscopic Structure.—The bulk of the rhizome consists of a uniform parenchyma traversed by fibro-vascular bundles. Some of the parenchyme cells are full of resin and essential oil, but most of them contain large starch grains of an elongated or club-shaped form.

Chemical Composition.—Galangal contains from $\frac{1}{3}$ to $\frac{1}{2}$ per cent. of an essential oil, which is the odorous principle. According to Vogl its

formula is $C_{10}H_{16}O$. Brandes extracted from galangal with ether a neutral, inodorous, tasteless crystalline body, kampferide, which requires further examination. The resin, which is probably the acrid principle, has not been examined.

Commerce.—Galangal arrives in Bombay from Canton and other Chinese ports. The imports are about 400 quintals yearly. Value, Rs. 3 8a. per maund of $37\frac{1}{2}$ lbs.

THE GREAT GALANGAL, though not so much used as the lesser, is well known in Bombay as baré-pân-ki-jar, malabáree-pân-ki-jar or kost-kuliján. The native dealers all state that it is imported from the Malabar coast. This drug is generally considered to be produced by the *Alpinia galanga*, Swartz, a native of Java. It is easily distinguished from the lesser galangal by its larger size, orange-brown exterior and yellowish-white interior. It is also less aromatic and pungent. Value, Rs. 50 per kandy of 7 cwt.

HEDYCHIMUM SPICATUM, *Smith*. AMOMACEÆ. *The rhizome. Vernacular:* KAFUR-KACHRI, KAPOOR-KACHRI (Hind., Beng., Bomb.); SHIMAI-KICH-CHILIK-KIZHANGU (Tam).

History, Uses, etc.—I have not met with any account of this drug in native works on materia medica, which seems strange, as it is very well known and a considerable article of commerce in India and China, and is also exported to Europe. Two kinds of kapur-kachri are found in the Bombay markets, viz., Chinese and Indian. The latter was supposed by Royle to be the sittarittee or lesser galangal of Ainslie ("Mat. Ind.," vol. i, p. 140), but Moodeen Sheriff states that the sittarittie of the Tamils is the true lesser galangal, which statement appears to be correct. Kapur-kachri is used in perfumery and to preserve clothes from insects. The Indian is preferred.

Description.—Indian kapur-kachri occurs in slices, mostly circular, but sometimes the section is made in a sloping direction. The slices are half an inch or less in diameter, and vary much in thickness; they are white and starchy, and when freshly pared exhibit a faint line dividing the cortical from the central portion. The edges of each slice are covered by a rough reddish-brown bark, marked with numerous scars and circular rings; here and there rootlets remain attached. The odor is like that of orris-root, but more powerful and strongly camphoraceous. The taste is pungent, bitter and aromatic. Chinese kapur-kachri is a little larger than the Indian, white and less pungent. The bark is smoother and of lighter color.

Microscopic Structure.—The rhizome consists of a delicate parenchyma, most of the cells of which are loaded with large ovoid starch grains; a few contain a yellowish resin and essential oil. The epidermis is composed of several rows of compressed, nearly empty reddish-brown cells. From the unaltered condition of the starch it appears that the rhizomes are not exposed to heat.

Commerce.—The Indian drug is said to be imported from the Malabar coast. The other kind comes from the Chinese ports. Value, Chinese, Rs. $4\frac{1}{2}$ per maund of $37\frac{1}{2}$ pounds; Indian, Rs. 5. The Arabs and Persians are the chief consumers.

KAMPFERIA ROTUNDA, *Linn.* AMOMACEÆ BHUICHAMPA of India.

This does not yield any of the zedoaries of commerce. It is commonly cultivated in gardens on account of the beauty and fragrance of its flowers, which appear in the hot weather before the leaves spring up. The fresh tubers are pounded, and applied by the natives to wounds, bruises and swellings. The root consists of several central, almost gloubular rhizomes, from which proceed numerous thick, fleshy rootlets, all of which terminate in small round tubers. The substance of the rhizomes is of a pale straw color, and has a bitter, pungent, camphoraceous taste, much like that of the true zedoary.—*Pharm. Journ. and Trans.*, April 17, 1880.

THE TESTING OF COMMERCIAL QUINIA SULPHATE.

The vast importance of quinia as a remedial agent, surpassing as it does that of almost all other medicines, is now so generally acknowledged that it is not surprising to find considerable attention directed to the means by which the purity of the salt most frequently met is to be ascertained. Some years ago there was published in this journal a description of a method for testing sulphate of quinia devised by Dr. G. Kerner, and based upon the differences existing between the solubilities of the sulphates of cinchona alkaloids in water and between the solubilities of the several alkaloids in dilute solution of ammonia.

That method of testing was a great improvement upon the test recommended by Zimmer and Liebig, based upon the differences in the solubility of quinia and other cinchona alkaloids in ether; it was on that account adopted in the German Pharmacopœia, but has not yet received further official recognition. The consequence has been that the results obtained in testing sulphate of quinia as to purity have

not always been of such a nature as to decide the question satisfactorily or at all, and it is somewhat notorious that sulphate of quinia has very frequently contained such an amount of cinchonidia sulphate as to be very far from entitled to rank as a pure preparation. That this should be the case is to a great extent intelligible from the circumstance that of late years it is said there has been in the manufacture of quinia a much larger use of those varieties of cinchona bark that contain considerable amounts of cinchonidia.

Three years ago attention was directed to this subject at an evening meeting of the Pharmaceutical Society, and it was shown that several commercial samples of quinia sulphate contained from 5 to 10 per cent. of cinchonidia sulphate. It was also shown that the indications furnished by the test directed in the British Pharmacopœia were not such as to give evidence of this impurity, and that there was really no difference between the result obtained in testing such samples and that obtained in testing really pure quinia sulphate. At that time it was suggested that a test based partly upon the different solubilities of the sulphates of quinia and cinchonidia in water, and partly upon the different solubilities of the corresponding alkaloids in ether, would be more useful for ascertaining the purity of quinia sulphate than either the test of the British Pharmacopœia or even that introduced years before by Dr. Kerner. Somewhat later almost exactly the same mode of testing quinia sulphate was recommended by Dr. Hesse, who described a form of apparatus in which the operation was to be conducted, and laid down rules by which some approximative estimate might be formed as to the amount of impurity present in the quinia sulphate operated upon.

It is in regard to this point that there is the greatest difficulty in obtaining trustworthy results by any of the known methods of testing quinia sulphate. Even with Kerner's test applied volumetrically the results obtained are liable to vary under the influence of slight differences of the conditions of experiment, and at the time when that test was introduced the knowledge of the alkaloids associated with quinia was sufficiently imperfect to give rise to additional uncertainty; now, however, it may be taken as certain that in almost every case the impurity met with in commercial quinia sulphate is nothing more nor less than cinchonidia sulphate. The great solubility of cinchonidia sulphate as compared with quinia sulphate is alone almost a guarantee that it cannot be present in a well prepared sample of quinia sulphate. As regards quinia, again, the probability of its occurrence is very

slight, for it must be remembered that there are but few kinds of cinchona bark which contain so much quinidia that its sulphate is likely to remain mixed with recrystallized quinia sulphate.

Quite recently, another paper on the subject has been published by Dr. Kerner, in which he specially refers to the misconceptions and errors which he thinks have arisen from Dr. Hesse's recommendations of a method for judging as to the quality of commercial quinia sulphate, and in justification of this view he instances the statement in a paper by Dr. Schacht, of Berlin, that a certain sample of quinia sulphate, tested as Dr. Hesse directs, gave a result showing that it contained "at least 3 per cent. of cinchonidia sulphate." He there mentions having long ago made use of the method recommended by Dr. Hesse, and based essentially upon the fact that cinchonia, quinidia and cinchonidia dissolve less readily in ether and separate from the ethereal solution more quickly when they are associated with very little or no quinia; but he adds that his experience at that time led him to regard this mode of testing as not being practical and trustworthy enough for its adoption as an official quinia test. He gives several reasons which lead him to infer that quantitative estimations according to the time the appearance of crystals in the ether solution takes place are altogether precarious and untrustworthy, and then goes on to state that the ammonia test carefully applied is so much more safe and delicate that it will admit of approximate determination of the impurities in commercial quinia sulphate, besides giving positive evidence of purity in the case of samples that are free from associated alkaloids.

We propose publishing in an early number of this journal a *résumé* of the directions given by Dr. Kerner for applying the ammonia test in order to ascertain the character of commercial quinia sulphate, and also for the purpose of determining more precisely the actual quantities of impurity present, and will now only mention one other point which he deals with, viz., the amount of water in the quinia sulphate of trade. It is well known that this salt normally contains a considerable amount of water of crystallization, and that this water is readily lost by efflorescence. Besides this, the voluminous character of the salt enables it to hold mechanically a variable excess of water to such an extent, as Dr. Kerner states, that apparently dry samples may be met with containing as much as 18 per cent. of water. It is also stated that such a result is not unfrequently brought about by devices of the manufacturer and by intentional moistening of the salt after it has

passed from his hands into commerce. Dr. Kerner suggests that the best remedy for this state of things would be to substitute the hydrochlorate in place of the sulphate, inasmuch as it is a more constant salt, and it has been found to possess advantages from a therapeutical point of view.

Still, since quinia sulphate is the official preparation and the one in general use, the question as to the amount of water in a sample is, as Dr. Kerner insists, one of importance as regards the determination of relative value of that sample; but at the same time he points out that it is not easy to decide what may reasonably be required in this respect, and that it is still less easy to determine quickly the amount of water in a sample of quinia sulphate than it is to detect minute traces of cinchonidia not indicated by the ammonia test. In most manuals of chemistry the neutral quinia sulphate is represented by the formula $2(\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2)\text{H}_2\text{SO}_4 + 7\text{H}_2\text{O}$, according to which the percentage amount of water would be 14.45. Dr. Hesse adopts formulæ with $7\frac{1}{2}$ and even 8 molecules of water, but Dr. Kenner has invariably found the loss of weight by drying at 115°C . to vary between 14.38 and 14.80 per cent. when the fresh salt pressed between the blotting paper and protected from efflorescence was operated upon. Consequently, he adopts the corresponding formula as correct, and as he considers it is impracticable in factory operations to prevent efflorescence altogether, while thoroughly removing all mechanically adherent water, he concludes that it must be regarded as a well founded requirement that official quinia sulphate should not at the utmost lose more than 14.6 per cent. of its weight when dried at 115°C . As a general rule he considers the loss of weight in good samples would be only 13.8 to 14.4 per cent.

By exposure to dry air at a moderate temperature the crystallized quinia sulphate gradually loses five molecules of water, or 10.32 per cent., forming the compound $2(\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2)\text{H}_2\text{SO}_4 + 2\text{H}_2\text{O}$, containing 4.6 per cent. water and 82.86 per cent. dry alkaloid. This salt is heavier than the above mentioned salt with seven molecules of water, and it has not so good an appearance, but it is constant, and though it can be thoroughly deprived of water of crystallization¹ even by drying at 100°C ., the anhydrous salt, $2(\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2)\text{H}_2\text{SO}_4$, containing 86.86

¹ See Cownley On the Water of Crystallization in Quinia Sulphate, "Phar. Journ." [3], vii, p. 189.

per cent. of alkaloid is so hygroscopic that it again attracts from the atmosphere two molecules of water more or less rapidly according to the humidity of the air.

Consideration of these facts leads Dr. Kerner to suggest that the constant salt with two molecules of water should be made official, with the view of preventing improper introduction of water or loss to druggists by efflorescence, and of ensuring the administration of quinia in precisely the doses desired. Meanwhile, however, he recommends the practice of making a determination of the amount of water an element in the valuation of commercial quinia sulphate, as being more important than the testing for such traces of cinchonidia as fail to be indicated by the ammonia test.

We share this view of the desirability of taking the percentage of water into account in testing quinia sulphate more thoroughly than we do that which gives a preference to the ammonia test, and are disposed to think that the modification of that test in which ether is used to ascertain the solubility of the alkaloid remaining in solution as sulphate after recrystallizing the sample in question from water will furnish a more intelligible result than any other we know of. The quantitative determination of the amount of impurity is, however, a matter requiring some considerable skill in analytical operations, and as regards anything less than 1 per cent. it may in general be dispensed with altogether for all practical purposes.—*Pharm. Jour. and Trans.*, July 10, 1880.

VARIETIES.

Iodide of Starch as an Antidote.—In a memoir read before the Medical Society of Florence, Dr. Bellini recommends iodide of starch as an antidote for poisons in general ("La Presse Méd. Belge"). This compound has no disagreeable taste, and has not the irritant properties of iodine; hence, the author concludes that it may be administered in large doses. It may be given without fear in all cases where the poison is unknown. It will be found very efficacious in poisoning by sulphuretted hydrogen gas, the alkaloids and alkaline sulphides, ammonia, and especially by alkalis with which iodine forms insoluble compounds. In this respect it is preferable to iodated tincture of iodine. It aids in the elimination of salts of lead and mercury. In cases of acute poisoning an emetic should be given before the antidote is administered.—*Med. Press and Circular*.

Tartrate of Morphia.—The new preparation of neutral tartrate of morphia is a useful adjunct to our therapeutics. Being very soluble, it passes quickly out of the

system, and gives less of the unpleasant after-effects than either the muriate or acetate. Its great solubility makes it particularly advantageous for subcutaneous injection. It gives little smarting or irritation when thus administered, and the solution never clogs the finest needles.—*Med. Press and Circular*, from *Ibid.*

A Perfect Solution of Salicylic Acid.—

R	Salicylic acid,				℥ i-℥ viii
	Citrate of potash,				℥ ii
	Glycerin,				℥ viii
	Simple elixir, q. s. to make				O i.

The citrate is to be dissolved in glycerin by the aid of a little heat, after which the acid is to be stirred in and a gentle heat maintained until it is completely dissolved. On cooling, simple elixir is to be added to bring it up to the required measurement. The solution is then to be strained, and when prepared with a colorless elixir is of the color of a very pale cherry. It contains five grains of salicylic acid to the fluidrachm, and is miscible in all proportions with water without the separation of any acid.

The above appears in the Louisville "News," the editor of which says it is "the best solution of salicylic acid he has ever used."—*Ohio Med. Recorder*, June, 1880.

Quebracho.—This new Brazilian remedy has lately been experimented with by Benzoldt of Erlangen ("Berlin Klin. Woch.," ch. 4—"Med. Jour."). On frogs and other lower animals he found that it produced complete paralysis of the motor system, of central origin, terminating in death by implication of the respiratory muscular system. In cases of dyspnoea and cyanosis, especially if associated with rapid pulse and respiration depending upon pulmonary affections, he found the drug to possess qualities promising a wide range of usefulness. Thus in cases of emphysema, complicated with pleuro-pneumonia, a considerable reduction of the frequency of the pulse and respiration, with corresponding relief of the subjective symptoms, and a general improvement was noted. Other similar cases afforded similarly favorable results. He attributes this effect to increased absorption of oxygen by the blood, as it was found on mixing freshly drawn blood with the fluid abstract of quebracho, that the former assumed a much brighter hue than did blood simply exposed to the air. In several cases of emphysema and other pulmonary affections, Dr. Langman obtained the sensations of relief and general improvement. The preparation employed is a fluid extract from the bark, the strength being 1 to 2. The dose was a fluidrachm, two or three times a day.—*Detroit Lancet*, June, 1880.

Pilocarpin in the Treatment of Prurigo.—Professor Oscar Simon, of Breslau ("Berlin Klin. Woch.," No. 49, 1879), reports good results from the use of jaborandi and pilocarpin in prurigo. According to Prof. Simon, the remedy softens the dry, harsh skin, and probably relieves the openings of the sweat ducts of the accumulation of epidermis, which, as the microscope shows, blocks them in prurigo.

On the average, a fortnight's pilocarpin treatment temporarily cures moderately severe cases of prurigo, while a month suffices for all but the very worst. Either subcutaneous injections of hydro-chlorate of pilocarpin (20 milligrams) or a syrup

of jaborandi were used; the latter is prepared by dissolving 18 parts of sugar in an infusion of jaborandi leaves, 3 parts, in water 15 parts. A dose for an adult is two or three tablespoonfuls, for children one or two teaspoonfuls. After the dose the patient was always wrapped up in blankets for two or three hours. The salivation and other well-known effects of pilocarpin accompany the sweating, which seems so valuable to the pruriginous patients. Prof. Simon has not found pilocarpin of use in other skin affections.—*Ibid.*

Oleate of Lead in Eczema.—James Sawyer, M.D., writes in the "British Medical Journal": After I had used for several months, both in hospital and in private practice, the ointment of oleate of zinc (for which the profession is indebted to Dr. Crocker, and which is certainly one of the best local remedies for eczema), I expressed my testimony in its favor in the issue of this journal for April 19, 1879. Thinking an oleate with lead for the base instead of zinc would be likely to prove a serviceable alternative application in eczema, especially when the soothing effects of lead might be desired, I asked Messrs. Southall, of Birmingham, to make for me an ointment of oleate of lead. After a series of experiments they produced an excellent preparation according to the following formula: Lead oleate, 24 parts; heavy and inodorous paraffin oil, 14 parts. The lead oleate is prepared by heating a mixture of oleic acid and oxide of lead. After using it for many months I can recommend this ointment as a very efficient local remedy in eczema.—*Louisville Med. News*, June 19, 1880.

A New Disinfectant.—A new disinfectant has been introduced in Australia, composed of one part of rectified oil of turpentine and seven parts of benzin, with five drops of oil of verbena to each ounce of the mixture. Its purifying and disinfecting properties are due to the power possessed by its ingredients of generating peroxide of hydrogen or ozone. Articles of clothing, furniture, wall-paper, books and papers may be saturated with it without damage. When it has once been freely applied to any rough or porous surface its action persists for an almost indefinite period. This may be shown readily at any time by putting a few drops of a solution of iodide of potassium on the surface which has been disinfected, when the ozone, which is being continually generated, will quickly liberate the iodine from its combination with the potassium, giving rise to a yellow discoloration, or a blue if boiled starch has been added to the iodide of potassium solution.—*Ibid.*, June 12, 1880.

Inhalations of Benzoate of Ammonium in Pulmonary Phthisis.—Dr. Wagner, of Buda Pesth, writes, in "Med. Chir. Centralblatt," that he prefers this salt to the benzoate of sodium, on account of its being more volatile, and thus capable of penetrating deeper into the smaller bronchioles than the latter, and also because it decomposes easier, leaving free benzoic acid, the anti-bacterial effect of which is greater than that of either of its salts. He lets his patients inhale until a burning sensation is produced in the chest, when the breathing becomes less labored, the cough easier and the appetite increases.—*The Medical Press and Circular*.—*Cincinnati Lancet and Clinic*, July 3, 1880.

A New Remedy for Hydrophobia.—M. Lesserteur has just given publicity to a plant which has a great reputation as a cure in the Kingdom of Annam. This plant, of which the name is Hoang-nan, is a kind of liana, closely akin to the false angostura; its effects are similar to those of strychnia and brucia. M. Bouley, in speaking of this new remedy in the "*Receuil de Médecine Vétérinaire*," regrets that no facts corroborative of its efficaciousness are given, but is of opinion that the property recently shown to belong to rabbits of easily contracting hydrophobia by inoculation should be utilized for making experiments thus so easily performed. In reference to this subject, M. Bouley related an anecdote about garlic, a substance which has always had a great reputation amongst remedies against rabies, and is constantly found as a principal integral portion in a large number of formulæ long kept secret. A young man had been bitten by a mad dog, and symptoms of rabies speedily appeared. His family, in a state of the greatest alarm, scarcely knowing what to do with the sufferer, shut him up in a loft where some garlic had been left to dry. In his delirium the poor fellow seized the bundles of garlic, ate greedily of them, and soon became exhausted and fell into a deep sleep. When he awoke he was cured, and the symptoms of rabies had disappeared.—*Ibid.*, June 5, 1880.

Disguising the Taste of Epsom Salts.—According to the "*Gaz. des Hôp.*," June 12, 1880, the *purgatif Yvon* consists of sulphate of magnesia 20 grams, water 40 grams, and essence of mint two or three drops. The essence of mint completely masks the disagreeable taste of the sulphate, providing that the quantity of the vehicle is inconsiderable.—*Med. and Surg. Reporter*, July 17, 1880.

The Decline of the Use of Salicylic Acid in the Treatment of Rheumatism.—In a paper, read by Dr. Greenhow before the Clinical Society of London, the question of the value of salicin and the salicylates of soda in the treatment of acute rheumatism was discussed. While admitting that these drugs gave great immediate relief, Dr. Greenhow stated that they did not lessen the complications of the disease; that they did not lessen the time when the patient was disabled; that they left him in a more than usual anæmic condition, and that they rarely lessened the hyperpyrexia. Several gentlemen agreed with Dr. G.'s views, more were inclined to think better of the drug than he, and none asserted it to be a specific.—*Med. Record*, July 10, 1880.

Another Antidote to Arsenic.—Dr. McCaw, a Canadian physician, suggests the following formula as one not generally known for an antidote to arsenic, and claims for it preference over all others for two reasons, namely, because it forms the surest antidote, and because the ingredients are always accessible:

R	Tincture of chloride of iron,	.	.	.	℥i
	Bicarbonate of soda, or potash,	.	.	.	3i
	Tepid water,	.	.	.	a teacupful.

These are mixed. The sesquioxide of iron is immediately formed in a solution of chloride of sodium.

The mixture may be given almost *ad libitum*.—*The Southern Med. Record*, May, 1880.

Artificial Slate is made by the "Combined Rubber-Goods Manufactories of Harburg and Vienna" by mixing in the machines used in caoutchouc manufacturies 16 parts of powdered pumice stone, 21 parts of animal charcoal, 10 parts of purified caoutchouc and 5 parts of sulphur. The mass is then rolled into sheets, heated, pressed and finally polished with pumice stone.—*Ber. d. Deutsch. Chem. Ges.*, xii, p. 2109.

French Polishing Rags, a new article of commerce for readily imparting bright polish to metals, and extensively advertised as "*Serviettes Magiques*," are made by saturating pieces of woolen cloth, about 70 centimeters in length and 10 cm. in width, with a mixture made by dissolving 4 grams Marseilles soap in 20 grams water, adding 2 grams tripoli and coloring red with a little fuchsin; the cloths are then allowed to dry.—*Pharm. Ztg.*, Nov. 29, 1879, p. 742.

A so-called Gold Varnish, suitable for protecting bright brass articles and for giving them an elegant appearance, is used by spreading over the metallic surface and heating immediately over an alcohol lamp in order to melt the ingredients. It may be made by any one of the three following formulas:

1. Seed-lac 200 parts, sandarac and mastic, each 80 parts, gamboge, dragons-blood and arnotta, each 20 parts, Venice turpentine 60 parts, red saunders 30 parts, and alcohol 1000 parts, digest and filter.

2. Shellac 10 parts, mastic 1 part, sandarac 1 part, powdered aloes 2 parts, powdered turmeric 5 parts, powdered saffron $\frac{1}{2}$ part, dragon's-blood 1 part, Venice turpentine $\frac{1}{2}$ part, and alcohol 100 parts; dissolve and filter. This varnish is applied thin with a fine brush to the surface previously well cleaned and heated to 30 or 35°C.

3. Sandarac 12 parts, mastic 6 parts, copaiba 2 parts, Venice turpentine 3 parts, oil of turpentine 4 parts, absolute alcohol 36 parts. This varnish is mixed with an equal quantity of a filtered solution of shellac 5 parts, dragon's blood 50 parts, and alcohol 50 parts.—*Pharm. Ztg.*, Dec. 3, 1879, p. 751.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Maryland College of Pharmacy.—The following gentlemen were elected officers of this College at a recent meeting for the ensuing year: President, Joseph Roberts; Secretary, Edwin Eareckson; Treasurer, Wm. H. Osborn; Examiner, Lewis Dohme. Officers elected in January, and holding over, are: Vice President, Wm. S. Thompson; Examiners—T. Hassencamp and N. H. Jennings. Messrs. L. Dohme, Chas. R. Rue, Jos. Roberts, T. Hassencamp and Edwin Eareckson were elected delegates to the American Pharmaceutical Association. Prof. J. Faris Moore, Chas. Caspari, Jr., and Wm. Simon, were elected delegates to the Convention of Teaching Colleges of Pharmacy.

Cleveland Pharmaceutical Association.—We note with pleasure that the druggists of Cleveland, Ohio, formed an association, known as the Cleveland Pharmaceutical Association, on the 13th ult., and elected the following gentlemen offi-

cers for the ensuing year: Daniel Meyers, President; S. P. Churchill, 1st Vice President; S. S. West, 2d Vice President; A. Mayell, Secretary; L. A. Cobb, Treasurer. Executive Committee—E. M. Hepler, W. H. Hartness, E. A. Sheltrager, M. L. Tray and L. Dreher.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Directory of Chemists and Druggists, as well as Chemical Manufacturers, Wholesale Druggists, Dry Salters, and other Kindred Trades in England, Scotland and Wales, as also the Principal Towns of Ireland. London: Kelly & Co., 51 Great Queen street, Lincoln's Inn Fields, W. C., 1880.

From the above title one can see how useful to any extending their business such a volume would be, whether as furnishing them with information when desiring to import, or finding out the best outlets for goods which they may feel they are able to sell to advantage abroad. The work is well arranged and distinctly printed, and can be had by writing as above. Price, fifteen shillings.

Nasopharyngeal Catarrh. By M. F. Coomes, M.D. Louisville: Bradley & Gilbert, 1880.

The above treatise upon a disease that has baffled the best efforts of the profession treats first of the anatomy of the parts involved, the various methods of treatment, both local and constitutional, of the various forms it assumes. Of course, it is out of our province to criticise.

The Catalogue of the Library of the Pharmaceutical Society of Great Britain, 1880.

The regulations of the library, the method of arrangement. The book is a pretty closely printed volume of 445 pages, and indicates about 4,500 titles.

OBITUARY.

JOHN J. FROST.—A note from Vincent Davis, Secretary of the State Board of Pharmacy of Kentucky, informs us of the death of Mr. John J. Frost, late President of the Pharmacy Board of that State, which took place in Lexington on June 1st. The following resolutions were passed by the Board:

Resolved, That, in the death of John J. Frost the State Board of Pharmacy has lost a prudent, wise and faithful officer and counselor, the profession of pharmacy an accomplished and conscientious member, and the community at large a valued citizen.

Resolved, That a certified copy of these proceedings be forwarded to the family of the deceased, with assurances of the sympathy of the members of this Board; also that a copy of the same be entered upon the records of the Board, and a copy sent to the Secretaries of the American and the Kentucky Pharmaceutical Associations.

W. H. AVERILL, *President*.

VINCENT DAVIS, *Secretary*.

THE AMERICAN JOURNAL OF PHARMACY.

SEPTEMBER, 1880.

CORNUS CIRCINATA.

BY ROBERT GIBSON, JR., PH.G.

From an Inaugural Essay.

The bark used for my experiment was obtained from North Carolina, and I subjected it to the following process :

Two pounds of the bark in moderately coarse powder were macerated with cold water for twenty-four hours, and then transferred to a percolator and cold water poured upon it until the displaced liquid passed colorless and tasteless. The percolate obtained was of a deep red color, and showed by testing with the sesquichloride of iron, the presence of tannin, to deprive it of which the menstruum was treated by continuous agitation with the carbonate and the oxide of lead.

First used the carbonate and then the oxide, and found that the oxide detannated it much more readily. Then I used the oxide exclusively in detannating, then filtered it, and obtained a filtrate of a much lighter color and of a bitter astringent taste.

This menstruum was evaporated down to the consistency of a soft extract, which was of a bright red-brown color and of a very bitter taste, and much more lasting than the taste left by the menstruum. Treated this extract with stronger alcohol, successively, until thoroughly exhausted of the bitter principle, and mixed the alcoholic solutions, and obtained an alcoholic solution containing the bitter principle, associated with some sugar and coloring matter, and an insoluble waxy-like mass as a residue which, on being dissolved in water and heated with a few drops of solution of sulphate of copper, solution of soda and sulphuric acid, produced the characteristic brown precipitate, showing the presence of sugar.

Then to the alcoholic solution added solution of subacetate lead in sufficient quantity to precipitate the coloring matter, then filtered it, and passed sulphuretted hydrogen through it to remove the lead ; filtered,

then evaporated spontaneously to a thin syrupy consistence, agitated it with a mixture of stronger alcohol and ether, in the proportion of one part of alcohol in seven of ether, to remove the sugar and coloring matter, and after allowing it to stand for twenty-four hours, decanted the ethereal solution carefully into a beaker, and allowed it to evaporate spontaneously, when granular-like crystals of "Cornin" were obtained of a dark yellow color.

These were dissolved in a mixture of alcohol and ether, and recrystallized; treated them in this manner successively a number of times, each time with a separate portion of the mixture, and on finally recrystallizing, I obtained them of a much lighter color, but still having that dark yellow cast. Various other efforts were made, but unsuccessfully, to obtain them in a pure state; the coloration is due most likely to a great extent to the presence of tannin, of which, in the detannating process, it had not all been deprived on account of decomposition of the aqueous menstruum, occasioned by the temperature of the atmosphere and by the length of time required to fully accomplish the process.

The process adopted in this experiment was the one used, or rather the most practical of the three processes followed, by Mr. Frey, of "79," in his investigations of *Cornus Florida*.

FUCUS VESICULOSUS.

BY FRANK FRISBY, PH.G.

Abstract from an Inaugural Essay.

Fucus vesiculosus belongs to the Cryptogamia Algæ in the sexual system, and to the natural order Algacæ. This sea weed is perennial, with the frond or leaf flat, smooth and glassy, from one to five inches long and from quarter of an inch to one inch broad, with a midrib throughout its length, entire upon the margin, and of a dark olive-green color; small spherical vesicles, filled with air, are immersed in the frond near the midrib.

The plant grows upon the shores of Europe and of this continent, attaching itself to the rocks by its expanded woody roots. It has a peculiar odor, and a nauseous saline taste. Much that is offered as *Fucus vesiculosus* is quite different. Out of three specimens I procured only one was the true *Fucus vesiculosus*. The various sea weeds and *Fucus nodosus* should always be carefully discriminated from the genuine plant.

Quantitative Examination.—Amount of water, 2·26, calculated from 10 grams.

Amount of ash, calculated for the dried plant, 1·59.

Amount of ash soluble in water, ·924.

Amount of ash soluble in hydrochloric acid, ·675.

The watery solution of the ash was made up to 30 cc.

To 10 cc. of the solution a solution of 1 part ferrous sulphate and 2 parts sulphate of copper was added; a dirty white precipitate of cuprous iodide (Cu_2I_2) was formed; when washed and dried it weighed ·109 gram, showing = ·072 iodine.

To the solution, after removal of the iodide, a solution of nitrate of silver was added, which gave a white precipitate of bromide and chloride of silver. When washed, dried and fused it weighed ·427 gram. The double salt was then transferred to a light weighed bulb tube, and fused in the bulb. The mass was allowed to cool and then weighed. Through this a slow stream of dry, pure chlorine gas was conducted, and heat was then applied to the contents of the bulb to fusion, and the contents occasionally made to roll about by revolving the bulb. After about 25 minutes the tube was taken off and allowed to cool. The tube was then held in an oblique position, that the chlorine gas might pass out and be replaced by atmospheric air, and then weighed. The tube was heated again in the same way and the process repeated until the two last weighings were the same. The fused mass, after treatment with chlorine, gave ·380 gram of pure chloride of silver. The difference between the mixed silver bromide and chloride and the chloride of silver was found to be ·047 gram.

The difference between the molecular weight of $\frac{\text{Ag Br}}{188}$ and $\frac{\text{Ag Cl}}{143\cdot5}$ = 44·5, thus giving ·198 silver bromide, ·084 bromine, ·227 silver chloride, = 0·56 chlorine.

Separation of Potash and Soda.—In this separation the two salts must exist as chloride. Therefore the bromide and iodide were converted by evaporating to dryness 10 cc. of the solution of the ash with hydrochloric acid in excess. The amount of double chloride of potassa and soda determined and found to weigh ·209 gram. This was dissolved in a little water, a concentrated neutral solution of bichloride of platinum added in excess, and evaporated in a porcelain dish nearly to dryness, at a very low heat. Spirits of wine was then added to the residue. This was allowed to stand for four hours. The undissolved last was then transferred to a weighed filter and washed with spirits of

wine, dried at 100°C. and weighed. Weight found to be .390 gram. This gave .061 gram potassium, and the sodium .037 gram.

The hydrochloric solution was made up to 30 cc.

Estimation of Phosphoric Acid.—To 10 cc. of solution a solution of acetic acid and a solution of acetate of sesquioxide of iron was added, producing a white precipitate of ferric phosphate. When dried at a very low heat it weighed .191 gram, thus showing .120 gram phosphoric acid.

Estimation of Sulphuric Acid.—To 10 cc. of the solution barium chloride was added until no further precipitate was noticeable. The precipitate was allowed to settle, and the liquid decanted from it; it was then further washed by decantation, filtered, dried, and weighed .080 gram, which indicates .032 gram sulphuric acid.

Estimation of Calcium.—10 cc. of solution was evaporated nearly to dryness and treated with strong alcohol until the product dissolved. A slight excess of concentrated sulphuric acid was added, and the solution allowed to stand two hours. The precipitate was then transferred to a weighed filter, and washed with strong alcohol until the filtrate gave no acid reaction to test paper. After the removal of all the free acid the washing was continued with 40 per cent. alcohol until the filtrate left no residue on evaporation. The precipitate was then dried and weighed, and the process repeated until the last two weighings were the same, .145, which shows .042 calcium.

Estimation of Magnesia.—10 cc. of the solution was taken. The calcium was removed as oxalate. The solution was evaporated to about one-fourth and an excess of pure dilute sulphuric acid added; this was evaporated to dryness in a weighed porcelain dish, at a very low heat. The heat was gradually applied. The flame was made to play on the cover from above until there was no excess of acid, then agitated over a lamp; when cooled it weighed .142 sulphate of magnesia, $\frac{\text{MgSO}_4}{120}$ indicating .025 magnesia.

Summary.—

A	{	Water,	2.26
		Ash,	1.59
		Organic matter,	6.15 = 10.
		Potassium chloride,	.348
B	{	Sodium iodide,	.252
		Sodium bromide,	.324
		Magnesium phosphate,	.312
		Calcium phosphate,	.225
		Calcium sulphate,	.138 = 1.599

By digesting the drug in boiling alcohol, and filtering while hot, and allowing to cool, small, colorless, slender, needle-shaped crystals were obtained, found to be mannite. Out of 10 grams .046 of mannite was obtained.

By distilling 10 grams of the drug .012 of odorous oil was obtained. The decoction gave an acid reaction to test paper, but I was unable to obtain any free acid.

Medical Action.—I restricted myself to dieting, which consisted in excluding from my food as nearly as possible all carbonaceous substances. No excess of exercise; sunlight; no liquids of any kind that contained any carbon. I commenced taking the fluid extract; one drachm doses four times daily, before meals and at bedtime. This was continued for five days. From that time the dose was increased to two drachms; this continued for five days. (At this point my urine showed signs of coloration.) The dose was then increased to half an ounce; at the expiration of four days my urine was decidedly colored, and had an extremely offensive odor, and when permitted to stand a separation of fat could be seen on top. On the fifteenth day I found I had lost in weight $1\frac{1}{2}$ pound, and on the twentieth day I had lost $4\frac{3}{4}$ pounds. The above experiments are all that I have so far made.

PRINOS VERTICELLATUS.

BY LOUIS CLAY COLLIER, PH.G.

Extract from an Inaugural Essay.

A quantity of the bark was procured, carefully examined and found to answer perfectly to the description given in the National Dispensatory.

The bark was properly comminuted, packed in a cylindrical percolator and thoroughly exhausted with alcohol.

The alcohol was recovered by distillation, and the residue, which was evaporated over a water bath to a semi-fluid consistence, was of a dark green color and extremely bitter.

It was then repeatedly agitated with petroleum benzin, which upon evaporation yielded a "wax" containing all of the chlorophyll, and left a residue, which I shall denominate A, of a yellowish-brown color.

The wax was of a beautiful dark green and upon heating emitted an aromatic odor resembling that of yellow wax and of about the same consistence, soluble in alcohol, ether and oil of turpentine.

Residue A was then treated with ether as long as the ether was discolored.

The ether was distilled off, over a water bath, and the yellowish mass which remained was precipitated with water, which precipitate proved to be *resin* of a yellowish color, odorless, tasteless and pulverizable.

The resin, by repeatedly dissolving in alcohol and precipitating in water, was obtained nearly white; but still having a slight yellowish cast, and was soluble in alcohol, ether and chloroform.

Residue B was then treated with water, in which it was entirely soluble.

A portion of it was treated with Tr. sesquichloride of iron, producing a greenish-black precipitate; another portion gave with solution of gelatin a flocculent precipitate indicating the presence of *tannin*.

Oxide of lead was then added to the whole solution, evaporated to dryness, redissolved in water and the excess of lead precipitated by sulphuretted hydrogen, and filtered.

To a small quantity of this solution was added a solution of potassic mercuric iodide; this, however, did not give a precipitate, thus showing that the bark does not contain an *alkaloid* as has been heretofore supposed.

Another portion of this solution, treated with Trommer's test, gave a red precipitate, showing presence of *grape sugar*.

To remove this sugar considerable difficulty was experienced; agitating it with a mixture of two parts ether and one of alcohol and allowing it to subside, decanting the clear liquid, and repeating the operation until on evaporating a portion no residue remained.

Upon evaporating this solution to dryness, and redissolving in water, it still gave reaction with Trommer's test showing grape sugar.

Subacetate of lead was added to the solution precipitating the bitter principle, leaving the sugar in solution.

The precipitate was thoroughly washed and diffused through water, the lead precipitated with sulphuretted hydrogen, filtered, and evaporated to dryness. It was then redissolved in water, purified animal charcoal added and again carefully evaporated to dryness.

This was exhausted with boiling alcohol and concentrated.

On allowing some of the bitter alcoholic solution to evaporate spontaneously, crystals of *cane sugar* were obtained.

The *bitter principle* was found deposited as an amorphous yellow powder.

An aqueous solution of the bitter principle gave reactions with the following reagents :

Perchloride of platinum gave a dark red precipitate, becoming brown on boiling.

Nitrate of silver gave a white precipitate, changing on boiling to red and on cooling to a chocolate color.

Protochloride of tin gave a white precipitate, changing to brown on boiling.

Bichloride of mercury gave a white precipitate, becoming reddish-brown on boiling.

Antimoniate of potassa, heavy white precipitate, changing yellowish-brown on boiling.

Concentrated mineral acids produced heavy a white precipitate.

Caustic alkalies, cinnamon-brown coloration.

The bark, which had previously been exhausted with alcohol, was percolated with water; this percolate, on boiling a short time and allowed to cool, threw down a flocculent precipitate, showing the presence of *vegetable albumen*.

This was filtered out and the filtrate precipitated with alcohol, which proved to be gum.

A decoction of the exhausted bark was made; on being treated with solution of iodine produced blue coloration, which disappeared on boiling; this indicated the presence of *starch*.

VIBURNUM PRUNIFOLIUM.

BY HERMAN VAN ALLEN, PH.G.

From an Inaugural Essay.

Viburnum prunifolium, natural order of *Caprifoliaceæ*, indigenous to North America. The bark of the root is found in pieces about two inches long and one inch wide externally, reddish-brown, lighter internally, breaks with a short fracture, is without odor, and of a very bitter taste.

Of the bark collected in June four ounces, in moderately fine powder, were percolated with stronger alcohol; the tincture evaporated to a syrupy consistence gave a dark green residue, of a very bitter taste; treatment with benzin removed a small portion of fatty matter, of a

dark green color, and ether afterwards dissolved a small portion of bitter principle. On evaporating the residue, it was found to be readily soluble in water, the solution giving no reaction with gelatin, but with salts of iron a dark green color was produced. Only a small portion of the bitter principle was found to be soluble in chloroform.

The aqueous extract was treated with acetate of lead, but only a small portion of coloring matter was removed, the resulting liquid being of a light brown color. To this sulphate of sodium was added, evaporated to dryness, and the bitter principle taken up with stronger alcohol, which on evaporating left a syrupy liquid of a very bitter taste.

Finding it impossible to obtain the bitter principle pure, the following course was tried: Two pounds of bark on being exhausted with stronger alcohol gave a dark brown percolate, to which, on evaporating, acetate of lead was added, and by filtering, a portion of the coloring matter was removed. To this filtrate sulphate of sodium was added, and evaporated to dryness, and bitter principle taken up by alcohol fortior; percolation through animal charcoal failed to remove any of the color. This alcoholic solution was then evaporated to dryness, dissolved in water, and again treated with animal charcoal, when a portion of the coloring matter was removed, but the percolate was still slightly colored. A small portion was evaporated and treated with ether and chloroform, but nothing was taken up by these solvents. The aqueous percolate was then treated by dialysis, and the resulting liquid was found to be still slightly colored, very bitter, and to give a copious precipitate with Trommer's test for sugar. Various solvents were used to obtain the bitter principle free from the sugar, such as a mixture of equal parts of alcohol and ether, stronger ether, benzin, chloroform, carbon bisulphide, or to precipitate it with mercury bichloride, but it was not affected by any of these reagents. It is probably a glucoside, or allied sugar. The alcoholic solution gave negative results with the general tests for alkaloids.

Examination of Coloring Matter.—That portion which was precipitated by acetate of lead was dissolved in boiling water; sulphuretted hydrogen gas was passed into this, giving it a dark red color; this was continued as long as a precipitate was produced, then filtered and evaporated to dryness and dissolved in water, when it gave the following results: With solution of gelatin, a light brown precipitate of tannin; with chloride of iron, a greenish-black; with subacetate of lead, light gray; with sulphate of copper, light green; and when evaporated to dry-

ness, left a brown residue of a slightly bitter and astringent taste. The precipitate containing sulphide of lead was then treated with hot alcohol; the resulting solution was of a dark brown color, and gave the following results, alcohol having been previously added to the test solutions: Solution of mercury bichloride first becomes clear by oxidation, then, if more be added, a grayish-white precipitate is produced; chloride of iron, greenish-black; caustic potash, clear, then a brown precipitate; caustic soda, dark brown; subacetate of lead, brownish-gray.

Ethereal Percolate.—Three ounces of the bark were exhausted with ether, the resulting percolate being of a dark green color, which gave a decided precipitate with solution of gelatin; was then detannated with oxide of lead, evaporated to dryness, and the bitter principle taken up with stronger alcohol, which leaves, on evaporating, a light yellowish-green mass, of a neutral reaction, and of a purely bitter taste, slightly soluble in water and freely so in alcohol; this corresponds in all respects to the viburnin obtained by Krämer from *Viburnum opulus*. The bark, after treating with ether, was then percolated with water; this percolate was found to have an acid reaction; it was then rendered alkaline by lime water, when a dark precipitate was obtained; this was filtered and tested for tartaric acid, but none was found. Then a portion of the precipitate was washed with dilute solution of hydrochloric acid, which, on being neutralized with ammonia, and acetic acid added, gave a precipitate of oxalic acid, also with solution of acetate of soda.

The filtrate obtained from lime water precipitation was boiled; when another precipitate was obtained this was filtered out, the precipitate washed with diluted acetic acid; this, when ammonia was added, remained clear, but on boiling a precipitate of citric acid was obtained. To the clear filtrate obtained, on boiling, an equal bulk of alcohol was added, when a precipitate of malate of calcium was obtained; this was washed on a filter with alcohol to remove coloring matter, then with boiling water to dissolve the malate. Acetate of lead added to this solution precipitated malate of lead, and when heated first agglutinated, then fused.

Valerianic Acid.—A decoction of a half pound of bark was then percolated with hot water; this percolate has an acid reaction, and on being distilled with sulphuric acid the distillate is slightly colored, has an odor of old apples and an acid reaction; this was neutralized with the officinal solution of caustic soda, sp. gr. 1.071, evaporated to dry-

ness, dissolved in water and again distilled with sulphuric acid; the distillate was slightly colored, and had the distinct odor of valerianic acid; this was neutralized with caustic soda and evaporated to dryness. A portion of the resulting valerianate of soda was dissolved in amyl alcohol, sulphuric acid added, and heated, when the characteristic apple odor was developed. An aqueous solution of valerianate of soda and of sulphate of zinc were heated separately and then mixed, when, on cooling, crystals of valerianate of zinc separated in white pearly crystalline masses; these are soluble in alcohol, and in a large quantity of water, and have a styptic taste and an acid reaction, turbid when heated, clear on cooling, and are soluble in ammonia water.

Analysis of Ash.—Twenty grams of the bark, in powder, were carefully dried and weighed; total weight, 18.6 grams; on incinerating, it was found to weigh 1.65 gram; on percolating with water and drying, it weighed 1.579 gram. The aqueous percolate gave a dense white precipitate with solution of chloride of barium, insoluble in boiling nitric acid, and on addition of water the precipitate is not dissolved, showing the presence of sulphuric acid. With solution of nitrate of silver a curdy white precipitate of chloride of silver was obtained, soluble in ammonia, insoluble in boiling nitric acid; on addition of perchloride of platinum to the original solution a precipitate of potassium was obtained.

The ash was percolated with dilute solution of hydrochloric acid, which caused it to effervesce, showing the presence of carbonates; the ash was nearly all dissolved, only a slight portion remaining on the filter. The filtrate gave a copious precipitate with ferrocyanide of potassium, showing the presence of the ferric salts of iron. When ammonia was added to the filtrate it became cloudy, and clear again on addition of acetic acid. Ammonia was added to the filtrate to precipitate the iron, filtered, and to the filtrate solution of chloride and carbonate of ammonia, boiled and filtered, when a precipitate was formed. This was filtered, washed and dissolved in acetic acid; this gave no reaction with chromate of potassium, showing the absence of barium; but with oxalate of ammonia a white precipitate of calcium oxalate was formed. The filtrate gave a copious precipitate with phosphate of ammonia, showing the presence of magnesium. The small residue of ash remaining undissolved in hydrochloric acid solution under the blow-pipe only gave evidence of iron.

Chemical Constituents.—1, a brown resinous body, of a very bitter

taste, from which it was found impossible to separate the sugar; 2, a greenish-yellow resin or neutral body, of a bitter taste, slightly soluble in water, freely so in alcohol, called by Krämer viburnin; 3, a volatile acid answering to all the tests of valerianic acid; 4, a tannic acid, giving greenish-black color with ferric salts; 5, oxalic acid; 6, citric acid; 7, malic acid; 8, sulphates, and, 9, chlorides of calcium, magnesium, potassium and iron.

EUGENIC ACID.

BY L. C. PETTIT.

Extract from an Inaugural Essay.

The following experiments were made with the volatile oils of cloves, pimento and bay, with reference to the amount of eugenic acid contained in each of them:

A strong solution of caustic potassa was added to the oil of cloves, which occasioned a yellowish-white precipitate; to prevent the mixture becoming solid small quantities of water were added, and the potassa solution was added as long as it produced any perceptible effect.

When an excess of potassa had been added the liquid assumed a deep red color, and lost the peculiar odor of oil of cloves.

The mixture was transferred to a glass retort connected with a Liebig condenser, but the excessive bumping prevented distillation. After adding to a portion of the liquid a number of fragments of glass and placing the retort on a sand-bath the distillation was proceeded with until the residue was nearly destitute of odor; sulphuric acid was then added to the mixture, which set free the eugenic acid, as a light-colored oily liquid, that changed to brown in a short time.

Diluted sulphuric acid was added to the solution of eugenate of potassium to effect decomposition, and then the whole was submitted to distillation. By this means a milk-like mixture of eugenic acid and water was obtained, that became clear after standing for several days, the eugenic acid falling to the bottom of the receiver as a clear, colorless oily liquid, which remained unchanged while it was protected by the water.

When the acid was withdrawn and placed over strong sulphuric acid under a glass receiver it assumed a deep ruby-red color, and the sulphuric acid changed to a brown.

A portion of the first formed solution of eugenate of potassium was heated to drive off the light oil of cloves, and sufficient sulphuric acid was added to neutralize the potassa, alcohol added and the sulphate of potassium removed.

This alcoholic solution of eugenic acid was digested with animal charcoal at a high temperature for half an hour without decolorizing it.

One-half of this solution was set aside to crystallize, the other treated with diluted sulphuric acid.

The crude eugenic acid was washed with cold water and rectified by distillation from a small flask by the heat of a sand-bath.

The eugenic acid came over at 416°F . (213°C .) as a clear, colorless oily liquid, with an empyreumatic odor; a black charred mass was left in the flask, which dissolved in liquor potassa and was wholly volatilized by heating on platinum foil; after standing, the rectified acid assumed an odor resembling oil of cloves, had a hot burning taste and became colored on standing.

The amount of crude acid obtained from 15.5 grams of oil of cloves in the above-mentioned manner was 12.6 grams, which rectifying reduced to 11.2 grams, or about 72 per cent.

The solution of eugenate of potassium which had been set aside to crystallize yielded a solid mass of feathery white crystals, which were washed with benzin to remove the mother liquor, drained and dried on filtering paper at a low temperature.

One decigram of the eugenate of potassium was well shaken with 10 grams of benzin, the liquid decanted, the residue carefully dried, and the loss was found to be .01 gram. This shows that it requires 1,000 parts of benzin to dissolve one of eugenate of potassium.

It is soluble in alcohol and glycerin, and is decomposed by water; has a strong odor of cloves, and a hot, acrid taste; with liquorice root and tragacanth it can be readily made into pills.

Oil of pimento was treated in a manner similar to that detailed for the oil of cloves, and the results were somewhat similar, the liquid, however, becoming a deep red color; the residue was treated as in the first detailed experiments, with similar results, the acid having an odor like that obtained from oil of cloves, and the residuum in the flask being similar.

Fifteen and a half grams of oil of pimento gave 11.1 grams of crude acid, and upon rectification 9.5 grams were left; this gives 61 per cent.

A fresh portion of oil was treated with an excess of strong potassa solution, diluted, permitted to stand for a time in a test tube, and the light oil rising to the surface was separated; if an excess of water was added the eugenate of potassium would be decomposed.

To a small portion of the light oil, after it was carefully dried, bright pieces of metallic sodium were added; these produced no immediate effect, the sodium remaining bright; but after twenty-four hours the light oil became a brownish-red, the sodium still remaining brilliant; when oil of pimento is thus treated with sodium a rise of temperature ensues, effervescence takes place, and a solid mass results.

When oil of bay was treated in a similar manner a yellowish-white precipitate was formed, which dissolved in an excess of the potassa solution; the light oil separated without distillation.

When 15.5 grams of the oil of bay were treated like oil of cloves and oil of pimento 7.5 grams of eugenic acid were obtained, which when rectified left 6.4 grams; this shows 41 per cent.

Treated with metallic sodium, the light oil from oil of bay when dried was not affected; upon standing, it became red-brown.

The oil of bay when treated with metallic sodium effervesces, rises in temperature and becomes a crystalline mass; strong nitric acid reacts violently with it, but does not take fire, becoming at length of a deep brown red color; strong sulphuric acid turns it brown-red without effervescence, and does not acquire the purple color that oil of cloves does.

The eugenic acid from oil of bay gave a crimson-red color with sulphuric acid; sulphuric acid and bichromate of potassium turned green, which gradually deepened on standing; strong nitric acid gave a deep brown red liquid and a resinous mass.

The reactions with oil of cloves and strong sulphuric acid, first a red and finally a deep purple color; with oil of pimento, a deep crimson-red color.

Eugenic acid from oil of cloves, first a red color, changing to a purple not so deep as that from the oil.

Eugenic acid from oil of pimento, same red color, changing to purple.

Oil of cloves when treated with sulphuric acid and bichromate of potassium first yields a dark green color, which deepens on standing; the oil of pimento and eugenic acid from each of the oils first gives a light green, which deepens upon standing; in each of the oils the

green color was accompanied with a light brown layer around the edges of the liquid.

The reaction of the oil of pimento and acid from it with iodine gave rise to a red-brown color that became very dark on standing twenty-four hours; oil of cloves and the acid from it when treated in like manner gave similar coloration, but not so deep; when treated with mercuric chloride the oil of cloves and its acid at a gentle heat gave a deep purple color; the oil of pimento under similar treatment gave less color.

Strong nitric acid produced a violent reaction with each of the oils, but did not inflame. The color by oil of pimento was a light red-brown, that by oil of cloves darker.

The eugenic acid prepared from each gave effervescence and deep red-brown color, and on standing for twenty-four hours with nitric acid, both oils and acid gave crystalline deposits, greater in amount from the oil of cloves than from the other. The crystals were very soluble in water, yielding precipitates with chloride of calcium soluble in hydrochloric but insoluble in acetic acid; solution of permanganate of potassium with sulphuric acid turns light brown with oil of pimento, and this becomes darker on further additions of the reagent; oil of cloves gives similar reactions, but more decided. The eugenic acid derived from both oils gives crimson-red color; both oils and acids decolorize the solution and give brown precipitates.

The specific gravity of eugenic acid was found by experiment to be 1.0785; this applies to acid obtained from oil of pimento.

Throughout these experiments the acid prepared from the oils gave similar reactions under the same treatment, and their physical properties were alike; the odors of oils of pimento and bay seemed to be due to their hydrocarbons, but the odor of that from oil of cloves does not have the characteristic odor of the oil. Eugenic acid can be obtained more economically from oil of cloves, but with less trouble from oil of pimento.

When applied to the skin it produces a burning sensation. Chlorine gas when passed into it produces a greenish-white turbidity, increasing as more gas is passed through it. Hydrochloric acid produces the same color, but is not increased in intensity. It is insoluble in glycerin.

After drying over concentrated sulphuric acid, at a low temperature, small crystals were seen floating on the top of the eugenic acid; strong

hydrochloric acid while cold produces no effect ; but on heating, it deflagrates violently ; aqua regia turns it a deep brown-red color, and finally chars it.

The composition of the acid was determined by Bonastre and Dumas to be

C_{10}	H_{12}	$O_2 =$
73.18	7.13	19.51

The medicinal properties and compounds are but little known.

CHARACTERISTIC TESTS OF BEESWAX—VEGETABLE AND ARTIFICIAL.

BY H. HAGER.

Translated and condensed from "Pharm. Centralh.," April 8, 1880, p. 119-121, by LOUIS VON COLTZAUSEN, PH.G.

The analysis makes the following processes necessary :

1. *Determining the specific gravity.* In case the mass does not contain moisture cut off five or more small pieces or melt a few grams in an evaporating dish supplied with a lip, drop the wax on a pane of glass which has previously been wiped off with a moist cloth, and place the glass into cold water. The drops will either readily drop off at the slightest touch, or are removed at the expiration of half an hour with a knife. The specific gravity is then determined as usual by the floating test, which consists in mixing alcohol and water in such a proportion that the wax-drops will float in the mixture without showing a tendency to rise or sink. The drops containing air-bubbles can be readily recognized and are rejected. The specific gravity of pure yellow or white wax lies between 0.956 and 0.964, usually between 0.958 to 0.960. If, therefore, the specific gravity of the suspected wax is not between 0.956 to 0.964 it is very probably adulterated. Wax containing an admixture of stearic acid, resin or Japan vegetable-wax has usually a higher, and wax adulterated with tallow, paraffin or ceresin, a lower specific gravity.

2. *Dissolving in hot chloroform or in a fatty oil.* The solution of dry beeswax is clear, but slightly cloudy in case the wax was moist, but ought not to contain any sediment, which, if present, ought to be collected and determined (mineral substances, starch, etc.).

3. *Borax test.* 6 to 8 cc. cold saturated borax solution are heated in a test tube with a piece of the suspected wax as large as a bean,

until it melts, when the mixture is shaken gently. The aqueous liquid becomes slightly cloudy if the wax is pure beeswax, but never becomes milky. When set aside for cooling the layer of wax collects on the surface of the liquid, leaving the latter almost clear, or only slightly turbid or half translucent. If it becomes milky immediately and remains translucent and milky even after cooling, either Japan vegetable wax or stearin are present. Resin and Brazil vegetable wax act like pure beeswax in this test.

4. *Soda test.* Mix in a test tube a piece of wax, the size of a bean, and 6 to 7 cc. sodium carbonate solution (1 salt, 6 water). Heat in such a manner that the upper layer of the liquid is heated without agitation until the wax is melted. If much froth is noticed at the wax layer stearic acid is probably present. The whole is then heated to the boiling point. If the liquid becomes milky, milky-yellowish or milky white, Japan wax or stearic acid is present. In this case the aqueous liquid remains milky, even after cooling; in case Japan wax is present, more or less pasty, or even stiff, while if stearic acid is present the milky layer is usually liquid, and often appears crossed by clear layers. The wax layer on the surface is usually brittle and not hard.

Pure beeswax appears hard after cooling slowly, and the aqueous layer is cloudy, but not milky, frequently semi-translucent and entirely liquid.

If the beeswax contains pine resin this test will cause an entire separation of the resin. Instead of merely heating to the boiling point allow to boil for one minute and then to cool gradually. The mass then consists of three layers, an upper hard wax layer, a liquid slightly turbid middle aqueous layer, and a loose or flocculent resin layer on the bottom. The resin can then, of course, be readily determined quantitatively.

A FEW SPECIES OF RHUBARB.

BY H. V. SCHLAGINTWEIT.

Translated and condensed from "Ztschr. d. Allg. Oest. Apoth.," Ver., April 10, 1880, p. 170, by LOUIS VON COTZHAUSEN, PH.G.

The cultivation of rhubarb in India was hitherto unsuccessful. The so-called "India rhubarb" of commerce consists of roots cultivated in the neighboring districts of High Asia. There is as little of this in

the market as of the Persian product, while the so-called "Turkey rhubarb" is supplied by the Chinese, and is considered the best root. The exact species which yield the rhubarb of commerce do not seem to be known so far. The following species were noticed by the author on the side of the Himalaya towards India and in Tibet:

1. *Rheum emodi*, Wallich, a large plant, having a thick stem, growing from Bhutan and Sikkim to Kaschmia on the India side of the Himalaya, frequently reaching a height of more than six feet, and also indigenous to Western Tibet, but less abundant. In most districts of north-eastern and central dry High Asia its efficacy is greatly praised, while in the damp and warm districts of Sikkim and Bhutan the root seems to be inefficacious. The whole sour stems are eaten both stewed and raw, while the leaves are dried and smoked in Tibet and in the Eastern Himalaya.

2. *Rheum leucorrhizum*, Poll. (*Rh. tartaricum*, L.) During the period of inflorescence it is usually two inches (Engl.) high, then gradually grows to a height of one foot. It grows plentifully in the dry districts. The root is said to be very efficacious, and the leaves are also smoked. The following species were met with less frequently:

3. *Rheum webbianum*, Royle, is indigenous to the vicinity of Simla at an elevation of more than 12,000 feet, and is also found in Kumáou, principally in the passes over the Niti Ghat towards Gnári Khórsum.

4. *Rheum moorcroftianum*, Royle, is indigenous to Kumáou and Gurhvál at an elevation of 12,000 feet; this species has very small stems.

5. *Rheum spiciforme*, Royle. The root of this species is lighter and harder than usual, while the leaves are thick and tough. It is indigenous to Northwestern Tibet.

NOTE ON SOME "SPURIOUS GUMS" IMPORTED WITH MYRRH.¹

BY R. H. PARKER.

Last year I had the opportunity of selecting from several bales of unpicked myrrh a considerable quantity of numerous kinds of "spurious gums," to which I briefly referred in a paper² previously read before this Association, and I propose submitting to you as a sequel to that paper

¹ Read before the School of Pharmacy Students' Association, July 8, 1880.

² "Pharm. Journ.," [3], x., p. 81.

the results of a somewhat more detailed examination of the impurities there referred to.

It will, of course, be understood that these substances rarely find their way into the best parcels of "picked Turkey myrrh," being carefully rejected by the wholesale houses.

Five substances will be referred to, those met with in largest quantity, viz.:

1. Opaque bdellium.
2. African bdellium.
3. Opaque tasteless gum-resin.
4. Yellow tasteless gum-resin.
5. Bitter acrid gum.

The percentage composition of these impurities as given in this note is based upon the solubility of the substance in absolute alcohol and water, and will serve to give an idea of their constitution, but the results do not, of course, indicate the exact proximate constituents.

The general outline of the analysis is as follows:

Several of the largest and most characteristic of the tears were selected, the outer portions removed, so as to leave the "gum" quite free from extraneous impurity and, if sufficiently hard, reduced to a fine powder, otherwise, as in the case of "bitter acrid gum," cut into thin shavings with a knife.

Determination of Moisture and Ash.—About 1 gram of the powder, accurately weighed in a platinum dish, was exposed in a hot-air bath at 100°C. for several hours until it ceased to lose weight. The loss of weight = moisture. A little volatile oil might be dissipated in this process, but it is probable that a dry heat of 100°C. would not cause much error from that cause. The dry residue was then ignited until all traces of carbon were removed. The weight of dish and ash less that of dish (weighed after ignition) indicates "the ash." The "ash" is not included as a separate item in the percentage composition, because all extraneous matter had been removed; it would, therefore, have been in a state of combination with the gum, and would be included in the weight of that constituent.

Determination of Gum.—2 or 3 grams of the powder were digested with successive portions of absolute alcohol and the tincture decanted; when the soluble portion was nearly all removed, the residue was collected in a weighed filter, washed till the evaporated filtrate left no

residue, dried at 90°C. till constant and its weight taken; from this is calculated total percentage of gum.

An accurately weighed portion of the dried gum was treated with water until nothing further dissolved, the residue collected in a tared filter, dried at 100°C. and weighed. This weight, less that of filter, gives weight of gum insoluble in water; this deducted from that of total gum gives by difference gum soluble in water.

Determination of Resin, etc.—The weight of this is taken “by difference,” and includes resins, volatile oil, if any, and other substances soluble in absolute alcohol.

1. *Opaque Bdelium* (*Balsamodendron Playfairii*) is a very hard, yellow ochre-colored, opaque gum-resin, with but slight odor and a bitter taste. In common with other exudations from the genera *Balsamodendron* and *Boswellia*, tears of this substance frequently have portions of papery bark attached to their surface. Triturated with water, opaque bdelium forms a very good cream-colored emulsion. Cold absolute alcohol dissolves about 50 per cent.; the residue is not entirely soluble in water, the insoluble portion swelling up and giving the characters of bassorin.

The coloring matter appears to be due to a resin very soluble in alcohol, giving a canary yellow colored tincture; this resin is also soluble in ether, benzol and chloroform. The tincture (1 of gum-resin to 6 of rectified spirit) becomes slightly milky with alcoholic solution of plumbic acetate, gives a slight yellow precipitate with one drop of liq. plumbi subacet., and an intense greenish-black color with tinct. ferri perchlor.¹ The tincture is bitter and becomes milky with water.

The mucilage made by dissolving 1 part of the gum (completely washed with rectified spirit) in 40 of water is tasteless, partly precipitated by subacetate of lead and not at all by neutral acetate.

The ash (1.6 per cent.) appears to be chiefly calcic carbonate, dissolving entirely with effervescence in dilute acetic acid and giving a copious precipitate with ammonium oxalate.

Water distilled from opaque bdelium had the slight odor of the drug, but there was no appearance of oil globules in working on a small scale.

¹ Ferric chloride does not give this reaction with a tincture of “gum hodthai” or “gum hotai,” a substance which has been referred to the same botanical source as opaque bdelium.

Composition of opaque bdellium :

Soluble in alcohol (by difference),	47.42
Gum soluble in water,	30.01
Gum insoluble in water,	11.07
Moisture,	11.50
	<hr/> 100.00

2. *African Bdellium* (*Balsamodendron Africanum*) is a gum-resin, the fracture of which is of a dull slaty hue, the margins possessing a powdery resinous appearance ; it is hard, translucent in thin layers, red by transmitted light, has a bitter taste and its slight aromatic odor recalls that of black pepper. Triturated with water it does not form an emulsion, but on standing gives a nearly bright mucilage with a copious brown sediment. The mucilage is very thick unless a large quantity be added, indicating presence of a considerable proportion of gum allied with tragacanth.

The tincture of African bdellium is very light yellow ; almost the whole of the brown coloring matter is insoluble in alcohol, chloroform, ether and turpentine. Alcohol extracts about 15 per cent. ; one-half of the residue, including the coloring matter, is insoluble in water, simply swelling up like tragacanth, but dissolves to a brown solution with a little caustic potash.

The tincture (1 to 6) gives no precipitate with bromine, plumbic acetate, nor with ferric chloride ; a drop of liq. plumbi subacet. produces a slight precipitate, and water renders it milky.

The mucilage (made by treating with water the residue insoluble in alcohol) is tasteless, and gives a slight precipitate with subacetate but none with neutral acetate of lead.

The estimation of moisture and ash gave 13.6 per cent. of the former and 1.16 per cent. of the latter, consisting chiefly of calcic carbonate.

Distilled with water, African bdellium gave indication of the presence of a considerable quantity of volatile oil possessing the characteristic odor of the drug ; the first portion which came over was nearly colorless, the latter portion rather deep yellow, both lighter than water. The small quantity operated on did not admit of an exact percentage calculation.

Composition of African bdellium :

Soluble in alcohol (by difference),	15.4
Gum soluble in water,	33.2
Gum insoluble in water,	37.8
Moisture,	13.6
	<hr/> 100.0

Recorded analyses of African bdellium differ widely. Guibourt, in his fourth edition of "Drogues Simples," gives—

Resin,	59'0
Soluble gum,	9'2
Bassorin,	30'6
Volatile oil and loss,	1'2
	<hr/>
	100'0

while Planchon, in the seventh edition of the same work, says it yields 70'3 per cent. to boiling alcohol, the rest being a *gum completely soluble in water*.

3. *Opaque tasteless gum-resin* occurs in large tears with smooth surface, is very hard, has a dull waxy fracture and is almost devoid of color, odor and taste. Several pieces have papery bark attached, and two or three large tears were found imbedded in fine specimens of myrrh, suggesting their exudation from the same trunk under abnormal conditions, but the gum and resin differ materially from those of myrrh.

Triturated with water this substance gives a very slightly milky solution and a copious sediment. It is soft and adhesive between the teeth.

Alcohol dissolves about 60 per cent. ; the residue is almost entirely soluble in water.

In the air-bath a portion lost 7'6 per cent. at 100°C., and when ignited left 86'5 per cent. of ash, chiefly calcic carbonate.

The tincture (1 in 6) is not precipitated by bromine or plumbic acetate, or changed by ferric chloride or lead subacetate ; it becomes milky with water.

The mucilage is not affected by neutral acetate of lead and only slightly precipitated by subacetate.

Composition of opaque tasteless gum-resin :

Soluble in alcohol (by difference),	60'54
Gum soluble in water,	30'32
Gum insoluble in water,	1'54
Moisture,	7'60
	<hr/>
	100'00

4. *Yellow Tasteless Gum-Resin*.—This is at once recognized by the peculiar powdery yellow appearance of the surface of the tears, which are mostly small and irregular. It is yellowish-white in color, almost devoid of taste and odor, hard and easily powdered ; resinous when

chewed. It does not emulsify when triturated with water, the liquid becoming quite clear after deposition of much sediment.

Alcohol dissolves about 63 per cent. ; the residue is almost entirely soluble in water.

A portion lost 3.62 per cent. at 100°C., and on ignition left a residue, mostly calcic carbonate, equal to .48 per cent.

The tincture (1 in 6) is not changed by either lead solution, bromine solution, or by ferric chloride.

The mucilage gives a slight precipitate with subacetate, but none with neutral acetate of lead.

Composition of yellow tasteless gum-resin :

Soluble in alcohol (by difference),	.	.	.	63.16
Gum soluble in water,	.	.	.	31.76
Gum insoluble in water,	.	.	.	1.46
Moisture,	.	.	.	3.62
				<hr/>
				100.00

Chemically and constitutionally this appears almost identical with opaque tasteless gum-resin, but it differs physically in its gritty character when chewed, and in the powdery yellow and irregular surface of the tears.

5. *Bitter Acrid Gum*.—This appears to be one of the several substances that have received the native designation “googul,” and seems identical with the specimen 139*l* in the Pharmaceutical Society’s museum, but differs from the “googul” 139*j*. It occurs in very irregular tears of a yellowish-brown, or dark-brown color, sometimes very nearly colorless and transparent. Its taste is very bitter and persistently acrid, somewhat resembling ammoniacum. It is soft, receiving the impress of the nail, and a small piece can be kneaded between the fingers.

It readily forms when triturated with a small quantity of water a thick opaque mucilage, and, with the exception of a trifling residue, is entirely soluble in about 25 parts of water. This residue examined microscopically was seen to consist entirely of vegetable tissue, chiefly long fusiform prosenchymatous cells, with a few fragments of pitted vessels.

A portion lost at 100°C. 6.6 per cent., and left on ignition an ash of calcic carbonate equal to 1.11 per cent.

Cold absolute alcohol dissolves about 63 per cent.

The tincture (1 in 6) contains the bitter acrid principle, and is not

rendered milky by addition of water ; gives a very copious precipitate with subacetate of lead, becomes milky with neutral acetate, and gives a slight whitish precipitate with ferric chloride, but none with bromine solution.

The gum insoluble in alcohol forms with water a tasteless mucilage, which gives a copious precipitate with subacetate, but very little with neutral acetate.

On treating this substance with about six parts of water, the coloring matter and gum precipitated by subacetate of lead dissolve, the remainder forming a thick oily layer at the bottom of the vessel ; this layer again treated with three or four parts of water becomes of a very light yellow color and dissolves entirely in more water, giving a nearly colorless solution which is scarcely precipitated by subacetate of lead, and possesses in a marked degree the characteristic bitterness and acidity of the original substance. Distilled with water a very small quantity of oil came over slowly, floating on the distillate, which possessed the odor but not the taste of the gum.

Composition of bitter acrid gum :

Soluble in alcohol (by difference),	63.0
Gum insoluble in alcohol,	30.4
Moisture,	6.6
	<hr/>
	100.0

The alcoholic solution appears to contain the bitter acrid principle, essential oil and a substance precipitated by subacetate of lead, for the oily layer separating from the aqueous solution washed and dissolved in water gives scarcely any precipitate with subacetate, and the subsequent addition of alcohol causes no separation.

Bissa bôl was almost entirely absent from the bales of myrrh examined ; so also was Indian bdellium, unless the yellow tasteless gum-resin be that substance ; it differs, however, materially from the specimen of Indian bdellium in the Society's museum.

A considerable quantity of transparent gum was found which appears to resemble inferior acacia gum ; also several tears resembling externally the yellow tasteless gum-resin, some having an oily interior and an aromatic terebinthinate odor, while one tear, when broken, possessed an odor strongly resembling jargonelle pear.—*Pharm. and Trans.*, July 17, 1880.

IN the July number of this journal, page 356, we published a very interesting paper upon the histology of the Japanese belladonna. The following paper upon the chemical constituents most admirably supplements the former.

THE CONSTITUENTS OF JAPANESE BELLADONNA (*Scopolia japonica*).

Scopolia japonica, which is called by the Japanese rôôtô, or onishirikusa, or omisikusa, or omekikusa, or hashiridokoro (which last term is the most usual one), is a member of the natural family Solanaceæ, and is highly poisonous. Its root has been employed for a very long time by Japanese physicians, and there can be no doubt that it possesses valuable therapeutic properties.

The latter reside in two alkaloids, which were obtained in the following manner: The dried root was powdered and several times extracted with alcohol, the alcohol was distilled off from the united tinctures, the residue dissolved in water and filtered to remove the separated fat. The clear filtrate was now precipitated with solution of acetate of lead, the precipitate removed by filtration, the filtrate freed from excess of lead by sulphuretted hydrogen, and after again filtering the solution concentrated, at a moderate heat, on a water-bath. The thin liquid residue was mixed with sulphuric acid, the mixture shaken with chloroform and the chloroformic solution separated. On evaporation the latter left behind slender colorless needles, which were contaminated with a yellow, smeary mass. The whole residue was boiled with water, the liquid, after cooling, was filtered, the filtrate concentrated on the water-bath at a low temperature and cautiously mixed with ammonia. This produced a white precipitate, which was collected on a filter, washed with a little water and then dissolved in alcohol, which, on evaporation, left behind colorless crystals. These had the characteristics of an alkaloid. Owing to the minute proportion in which this alkaloid exists in the root, the quantity obtained was insufficient for an accurate investigation of its properties and nature. A few drops of the aqueous solution of the sulphate of this alkaloid dropped into the eye of a rabbit produced dilatation of the pupil. I propose to name this alkaloid rotoine (from the Japanese name rôôtô), and reserve to myself its further study.

The second alkaloid, which I term scopoleine, exists in the root in larger proportion. It is obtained by adding an excess of soda solution

to the acid liquid left after shaking with chloroform and by again shaking the now alkaline liquid with chloroform. The latter takes up the alkaloid and deposits it, on evaporation, in an impure condition, as a yellowish-brown, resinous mass. In order to purify it, it was dissolved in dilute sulphuric acid and the solution carefully mixed with sodium carbonate, as long as the precipitate was dirty and slimy. After filtering, a further quantity of sodium carbonate was added as long as a precipitate was formed. The latter was collected on a filter, washed and dissolved in chloroform. On evaporating the latter, the alkaloid was obtained as a yellowish, resinous mass, which, when perfectly dry, may be rubbed up to a yellowish-grey powder, possessing a great tendency to run together. I have been unable to obtain this alkaloid in a crystalline condition or to form crystallized salts. It is difficultly soluble in water, easily in acidulated water, also easily in chloroform and alcohol. All these solutions, except when supersaturated with acid, have a strong alkaline reaction. It yields precipitates with nearly all alkaloidal reagents.

Regarding its effect on the animal organism, I can at present (July 22, 1878, at a meeting held in Tenkion, Yedo, Japan—ED. N. R.) only say that it seems to act similarly to atropia. What relation it bears to the latter, however, I am not at present prepared to say, but hope to be soon able to give a fuller account of its composition, products of decomposition and physiological effects.—Dr. A. Langgaard, from "Mittheilungen der Deutschen Gesellschaft für Natur- und Völkerkunde Ost-Asiens," fol. Yokohama. No. 16 (December, 1878), p. 267.

Note by ED. N. R.—A short account of the root of *Scopolia japonica* and its uses, by Dr. G. Martin, of Tokio, Japan, may be found in the "Archiv der Pharmacie," December, 1878, p. 336. Dr. Martin states that it is called Japanese belladonna, but that its narcotic effects are much less marked than those of true belladonna. He says it contains solanine, but no atropine. The plant is further remarkable from the fact that it communicates to liquids a stronger fluorescence than any other known plant.—*Pharm. Journ. and Trans.*, July 3, 1880, from *New Remedies*, June, 1880.

QUINIC ACID, QUINONE AND THEIR DERIVATIVES.¹

By O. HESSE.

Quinic Acid.—The quinic acid employed in this investigation was chemically pure, and was prepared from the calcium salt by decomposition with oxalic acid, according to the method which has been previously described by the author. By evaporation of an aqueous solution of quinic acid, the greater part of the acid quickly separates in a crystalline form, but the mother liquor still contains amorphous quinic acid, and the author states that the presence of a very small quantity of a foreign substance is sufficient to hinder the crystallization. The amorphous acid can easily be converted into the crystalline form by purifying its calcium salt with animal charcoal, then proceeding as before described. Quinic acid contains no water of crystallization, and the author draws attention to this fact because from a misconception of his earlier statement on the subject Graebe has assumed the formula of quinic acid to be $C_7H_{12}O_6 + H_2O$.

Tetracetyl quinide, $C_7H_6(C_2H_3O)_4O_5$ m. p. 124° (uncorr.), is obtained as an amorphous mass which becomes vitreous on cooling by the action of acetic anhydride on quinic acid in a sealed tube at 170° . It is purified by melting it repeatedly in hot water and finally washing it with cold water. On being dried in the air it is obtained as a white powder, which is insoluble in cold water and soluble with difficulty in hot water. It melts in boiling water and is gradually decomposed by longer heating its aqueous solution, which then becomes acid. Its aqueous or alcoholic solution becomes turbid on being cooled, and the anhydride separates in granular crystals. The formula as above assigned to this body was confirmed by it yielding the anhydride (quinide) $C_7H_{10}O_5$ when boiled with magnesia, and quinic acid when decomposed with lime, the author having previously shown that quinide is converted by the action of lime into quinic acid.

Action of Bromine on Quinic Acid.—By the action of bromine on an aqueous solution of quinic acid an acid is obtained which the author had named carbohydroquinonic acid, on the supposition that it yielded hydroquinone when heated. But it was afterwards shown that the black precipitate which this decomposition product gave with ferric chloride was a pyrocatechin compound; hence the name of the acid was altered to carbopyrocatechuic acid. Strecker subsequently obtained

¹ Abstract of a paper in "Liebig's Annalen" [200], 232—255.

the same acid by fusing piperinic acid with caustic potash, and named it pyrocatechuic acid, and to him is improperly ascribed the discovery of this acid.

The author has repeated his former experiments, and this time on a large quantity of pyrocatechuic acid, which had been prepared as before by the action of bromine on quinic acid, and he now finds that hydroquinia is not produced, as he had previously assumed. When operating with a large quantity of pyrocatechuic acid the decomposition does not proceed very smoothly; a carbonaceous mass is formed whilst phenol and pyrocatechin distil over.

In addition to pyrocatechuic acid another acid is produced by the action of bromine on quinic acid. It can be obtained by evaporating the product of the reaction to a syrup, agitating it with ether, then treating the ether residue with lukewarm water in which the new acid is insoluble, but which dissolves the pyrocatechuic acid. It can be purified by recrystallization from boiling water. It crystallizes in colorless laminæ or in needles, which dissolve with some difficulty in boiling water and are almost insoluble in cold water, but easily dissolve in ether. It carbonizes when heated, giving pungent fumes and a brown colored distillate which solidifies to a radiated crystalline mass and, like the original substance, gives no coloration with ferric chloride. Its hot saturated solution gives no precipitate with lead acetate but a considerable quantity of a yellowish white precipitate with basic lead acetate. The composition of this substance has not yet been ascertained, but it is said to be a bromine derivative.

Action of Concentrated Hydrochloric Acid on Quinic Acid.—Warm concentrated hydrochloric acid quickly dissolves quinic acid, but without decomposition; but when heated with it at 140 to 150° in a sealed tube it is converted into hydroquinone and paraoxybenzoic acid.

Graebe obtained pyrocatechuic acid by the action of potassium hydrate on quinic acid, and the author states that a similar result ensues by using sodium hydrate, and that neither oxysalicylic acid nor hydroquinone carbonic acid is produced.

Quinone.—As an addendum to his former remarks on this substance the author states that it is somewhat readily soluble in boiling petroleum ether, but very readily so in boiling ligroin (*sic*), and as the greater part of the quinone recrystallizes out on cooling in beautiful yellow prisms, these solvents serve as a ready means of purifying this substance.

The author is unable to confirm the statement of Sarauw, that diace-

tylhydroquinone is formed by the action of acetic anhydride on quinone. He is of opinion that quinone is to be regarded as the aldehyd of quinone acid in this way :

Hydroquinone.	Quinone.	Quinonic Acid.
$C_6H_6O_2$	$C_6H_4O_2$	$C_6H_4O_4$
Alcohol.	Aldehyd.	Acid.

Hydroquinone.—In consequence of a statement by Hlasiwetz and Habermann ("Liebig's Annalen," 175, 62), with regard to the melting point of this body, the author has repeated his experiments and he now gives the melting point as 168 or 169° (uncorr.) instead of 172 or 173° (uncorr.). Hydroquinone is insoluble in boiling petroleum benzin, almost so in boiling chloroform, the chief part of it separating again from the latter on cooling. It forms no compound with phenol. Its concentrated aqueous solution gives a dark green or almost black precipitate of quinhydrone with ferric chloride or sulphate.

Quinhydrone is very easily soluble in slightly warm water, and this solution, unless disturbed, has a great tendency to remain saturated without crystallizing. Although in all cases the aqueous filtrate from the quinhydrone has a strong odor of quinone, yet it is impossible to obtain a complete conversion of hydroquinone to quinone by this method, nor even by heating the hydroquinone with ferric sulphate in a sealed tube at 80 to 100°. Quinone is, however, obtained in considerable quantity by the action of concentrated nitric acid on hydroquinone; by continuing the action of the nitric acid oxalic acid is produced.

Diacetylhydroquinone, m. p. 121° (uncorr.), is, contrary to the statements of other observers, an odorless and stable substance, even after long keeping.

Dinitrodiacetylhydroquinone, m. p. 94°, has been prepared and was of interest to the author, as he hoped that by the substitution of NH_2 for NO_2 in this compound a substance of the formula $C_{10}H_{12}N_2O_4$ would be obtained; in fact, a body which would stand in near relation to chitenin, $C_{19}H_{22}N_2O_4$, the dihydroxylquinia of Kerner. It was easily reduced by zinc and hydrochloric acid, yielding a base which, however, had no resemblance to chitenin or to any other alkaloid. In the free state this base was very unstable; its alcoholic solution gave a cherry-red color with ferric chloride.

Dipropionylhydroquinone, m. p. 113° (uncorr.), which crystallizes in colorless laminæ, and its mononitro-derivative, m. p. 86°, crystallizing

in pale yellow leafy crystals, have been obtained, and are described in detail.

Quinhydrone.—As is well known, this substance dissolves very easily in warm water, but it is partly decomposed thereby into quinone and hydroquinone, the solution acquiring the characteristic smell of quinone. It dissolves in hot glacial acetic acid apparently unaltered, and crystallizes out on cooling in greenish-black plates or prisms. It is insoluble in hot or cold petroleum ether and in ligroin. It is soluble with extreme difficulty in boiling chloroform, crystallizing out on cooling in small plates; but by this treatment the greater part of the quinhydrone is decomposed into quinone, which is carried away with the chloroform vapor, and into hydroquinone, which separates in colorless crystals. When heated it evolves bluish-violet fumes and gives a bluish-black sublimate.

The author does not agree with the structural formula assigned by Graebe or Wichelhaus to this body, but is of opinion that quinhydrone is to be regarded as a compound of one molecule of hydroquinone with one molecule of quinone, as by the action of acetic anhydride on it at 160 to 170° diacetylhydroquinone and quinone were obtained, the former approximating to the theoretical quantity. Phenoquinone, $C_{18}H_{16}O_4$, and methylquinhydrone, $C_{20}H_{20}O_6$, or $C_6H_4O_2 \cdot 2C_6H_4(OHCH_3)$, have been examined and the above formulæ assigned them by the author, who disputes the accuracy of the formulæ $C_{18}H_{14}O_4$ and $C_{20}H_{18}O_6$, as given them by Wichelhaus.

The Percentage of EXTRACTIVE SUBSTANCES soluble in ALCOHOL as a CRITERION of the PURITY of SPICES.¹

BY MAX BIECHELE.

The author employs the following method: A flask of about 120 cc. contents is fitted with a cork, through one of the two holes in which passes the stem of a funnel of about 7 cm. diameter; through the other, a tube leading to the top of an upright Liebig's condenser. Five grams of the spice to be tested, previously dried at 30°C., are placed on a filter, which should not quite fill the funnel, covered with a disk of filter paper, and absolute alcohol poured through until the flask is half full. The funnel is then covered with an inverted funnel, the stem of which has been broken off, leaving an aperture, through which

¹"Corr.-blatt d. Vereins analytischer Chemiker," 2, 70. Reprinted from the "Journ. of the Amer. Chem. Soc."

is passed the lower end of the condenser. The alcohol in the flask is then heated to boiling, and maintained at that temperature, until the prolonged percolation of the condensed alcohol through the spice has removed all soluble matters, and the filtrate is colorless. The filter, with its contents, is then partially dried at $100^{\circ}\text{C}.$, the contents removed to a weighed porcelain dish, thoroughly dried at $100^{\circ}\text{C}.$, and again weighed. The volatile character of many of the extractive substances (essential oils, etc.) renders it impossible to estimate the residue from the evaporation of the alcohol. Proceeding by the foregoing method, the author has obtained the following percentages of extract from pure spices :

Cloves,	.	.	:	.	.	.	.	33'50
Cassia bark,	.	.	.	.	.	.	.	26'60
Cinnamon (Ceylon),	.	.	.	.	.	.	.	23'90
Caraway seed,	.	.	.	.	.	.	.	33'87
Fennel	"	.	.	.	.	.	.	38'20
Black pepper,	.	.	.	.	.	.	.	19'87
Long	"	.	.	.	.	.	.	37'00
White	"	.	.	.	.	.	.	16'87
Red	"	.	.	.	.	.	.	18'13
Coriander seed,	.	.	.	.	.	.	.	14'88
Star-anise,	.	.	.	.	.	.	.	25'68
Anise seed,	.	.	.	.	.	.	.	36'24
Clove pepper,	.	.	.	.	.	.	.	22'68
Mace,	.	.	.	.	.	.	.	37'60
Nutmegs,	.	.	.	.	.	.	.	32'70

PERSIAN OPIUM.

The following memorandum on the opium of Persia is taken from a report on the trade of the Persian Gulf by Consul-General Ross:

From the time the attention of the native merchants was attracted to the trade in this article, about twenty-five years ago, there has been, with two or three exceptions, a gradual annual increase in the production of the drug. But this increase has never before been so very considerable as to become prominently noticeable.

It was reported in 1859 that about 3,000 "shah mans," or 300 cases, of opium were produced in Persia; and in 1861 that about 10,000 "shah mans," or 1,000 cases, were expected to yield from the crops of the year a quantity which was then noticed to be double the out-turn of the previous year.

In the trade report of this Residency for the year 1874-75, the fluctuations of the annual estimated produce of opium in Persia from the year 1868-69 to 1874-75 were shown in a tabular statement attached to a special report on the subject. The largest produce for any one year did not exceed 2,600 cases (a quantity inappreciably small in regard to the demands in China), and in 1874-75 it had fallen to some 2,000 cases. In the following year there was a further decline, the exports amounting to about 1,890 cases. Since 1876-77, however, a reaction appears to have taken place, as in that year 2,570 cases were exported from Bushire and Bunder Abbass alone.

In the early part of 1877-78 the probable yield of the crops was estimated at 3,500, but the actual number exported from Bushire and Bunder Abbass amounted to 4,730 cases.

Last year (1878-79) the out-turn was stated to have been 6,700 cases, while 5,900 were exported from these ports.

The probable yield of the crops of the current year, 1879-80, is at present estimated to be as follows:

	Shah Mans.	Cases.
In Khonsar, about	14,000	950
Kerman,	4,500	300
Yezd,	15,000	1,000
Ispahan,	37,000	2,400
Nereez,	6,000	400
Shiraz,	20,000	1,300
Kazran,	1,500	100
Shuster,	1,500	100
Total,	99,500	6,550

In addition to the above 6,550 cases of opium, about 3,000 "shah mans," or say 550 cases, are expected to come to Yezd from Herat, making the whole stock about 7,100 cases. The Shuster opium is sent through Mohammerah direct, and sometimes *via* Bushire to Mus-sat, for transmission to Zanzibar; but a part of it is supposed to be smuggled into the Indian frontier provinces *via* Mekran and Beloochi-stan. Thus, 7,000 cases are expected to be available during the current year for export through Bushire and Bunder Abbass to China and England.

Small quantities of opium are said to be grown in Tehran, Tabreez and Kermanshah, but these mostly find their way to Europe *via* Turkey, Smyrna being, it is alleged, the port where it is mainly taken to

and where it is mixed with the local drug and forwarded to the continental markets.

Opium is made up into cakes, varying in weight from $\frac{3}{4}$ lb. to $1\frac{1}{2}$ lb., and in number from 96 to 192 or more; and these are packed in fig or vine leaves, and sometimes in poppy seeds or stalks, into cases containing each from $10\frac{1}{2}$ to 11 "shah mans"—a "shah man" being equal to $13\frac{1}{2}$ lbs. English.

The object in so packing in cases as regards the weight is that the contents, after the deficiency caused by drying up in course of transit, which is calculated at from 5 to 10 per cent., may realize at destination (China) one "picul," which is about 135 lbs. Another reason is that the weight is arranged for convenience of carriage by pack animals (generally mules) employed in these regions.

About five-sixths of the produce of opium in Persia is intended for China. The drug suitable for that market being required to be fine, and prepared with oil, and not rich in morphia, permits its being swelled up with foreign substance, and thus being, as far as practicable, adulterated to the extent to preclude discovery by the mode of testing or "touching" used in China.

It is said that pure and superior opium, though not so finely manipulated, has been rejected in China, while the fine opium, containing admixtures, has found favor and fair market.

The preparations made for the China marts—being, say of a quality of 80 "touch" (containing 80 per cent. pure juice and 20 per cent. foreign substance)—yield from 9 per cent. to 10 per cent. morphia.

The preparations for England, which have recently been specially made pure, and which have come into favor in Europe and America, have, it is said, yielded morphia averaging about 12 per cent.

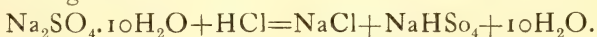
The average price for fair quality of opium suited for the China market has been for the last two years about 950 rupees per chest, and for the special preparations for England about 100 rupees more.

To these are added the charges of transit and other contingent expenses from the place of product to the port of shipment, amounting to about 30 rupees, and, further, a custom and octroi or other duty of about 20 rupees, payable by a Persian, or 5 per cent. *ad valorem* by a British or other foreign merchant.—*Pharm. Journ. and. Trans.*, June 12, 1880.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER, PH.D.

Inorganic Chemistry.—*On the Theory of Freezing-mixtures.*—A. Ditte shows that in cases where a reduction of temperature follows the mixing of a hydrated salt and an acid an anhydrous salt has been produced, and a large amount of water of hydration, previously existing in the solid form, becomes free and is liquefied. Thus, the reduction of temperature following when Glauber's salt with muriatic acid is explained by the following reaction:



The author therefore sought, in verification of this hypothesis, to produce a freezing mixture by rubbing together two salts which, while possessing nearly equal thermo-chemical value (so that no heat would be developed by their reaction upon each other), should liberate in their mutual decomposition water of hydration, which would then have to become liquid. He found as an actual fact that the rubbing together of ammonium nitrate and Glauber's salt produced a diminution of temperature of about 20°C ., ammonium nitrate and sodium phosphate together a loss of 18°C ., and ammonium nitrate and soda a loss of 25°C .—*Compt. Rend.*, No. 90, pp. 1191 and 1282.

Detection and Determination of Chlorine in Presence of Bromine and Iodine.—G. Vortman has discovered a method by means of which even small quantities of chlorine, along with the other halogens, can be easily and quickly detected. It depends on the different behavior of the chlorides, bromides and iodides with peroxides of manganese and lead in presence of acetic acid.

Iodides are partially decomposed by the above-mentioned peroxides, even in neutral solutions, and if they are boiled with the addition of acetic acid the iodine is completely eliminated. Lead peroxide oxidizes a part of the iodine to iodic acid, but with manganese peroxide no iodic acid is formed.

In a neutral solution bromides are not decomposed either by manganese or lead peroxide. In an acetic acid solution the lead peroxide only acts, bromine escapes, but bromic acid is formed only if bromides are present in considerable quantities. Manganese peroxide has no action in the acetic acid solution, even on prolonged heating. Chlorides are not attacked by either of the peroxides in presence of acetic acid. In testing for chlorides in presence of bromides or iodides, it is suffi-

cient to boil the substance in an acetic solution with lead peroxide until the liquid, on settling, is colorless and has not the slightest odor of bromine or iodine. The bromine and a part of the iodine escape as such; the remainder of the iodine remains as lead iodate along with the excess of the lead peroxide. On filtering and washing the precipitate all the chlorine is found in the filtrate free from bromine and iodine. In this manner the chlorine may be determined quantitatively. If the quantity of chlorine accompanying the iodine is considerable manganese peroxide is preferable to lead peroxide, as otherwise the liquid must be largely diluted with water to prevent lead chloride from depositing. In determining large quantities of chlorine in presence of bromine it is well to add along with the lead peroxide some potassium sulphate, so that all the chlorine may be found in the filtrate combined with potassium. In order to expel the liberated bromine and iodine more rapidly a moderate current of air may be passed through the solution on the water-bath.—*Chem. News*, June 18, 1880.

On the Behavior of Sulphuretted Hydrogen with the Salts of the Heavy Metals.—H. Delffs calls attention to the different precipitability of the metallic salts in presence of a strong mineral acid on the one hand and of acetic acid on the other. Just as the limit between precipitable and non-precipitable salts is altered by the use of acetic acid instead of hydrochloric acid it is further modified if formates are treated with sulphuretted hydrogen. In that case the salt of zinc is precipitated, but the compounds of cobalt, nickel, iron and manganese are not affected. Manganese cannot be precipitated by sulphuretted hydrogen from propionic, butyric and valerianic solutions. In precipitations by this last reagent several metals are never simultaneously converted into the corresponding sulphides, but the precipitation ensues in such manner that one metal is first completely separated before the removal of another begins. Upon this fact is founded a very convenient method for obtaining cobalt and nickel in a state of purity. As sulphuretted hydrogen first completely precipitates cobalt acetate, and then acts upon nickel acetate, a solution of the two nitrates is mixed with sodium acetate in quantity insufficient for complete double decomposition, and sulphuretted hydrogen is introduced so that, according to the respective proportions of the two metals, either nickel free from cobalt is obtained in solution, or cobalt free from nickel as a precipitate. The required quantity of sodium acetate may be calculated from the relative quantities of the two metals which are mostly known.—*Ibid.*, p. 279.

Organic Chemistry.—*Process for the Continuous Preparation of Acetic Ether*—J. A. Pabst has devised a process in imitation of that for the preparation of common ether. 50 cc. sulphuric acid and the same quantity of alcohol are heated together in a retort to 140°C ., and then a mixture of 1 liter of 96 per cent. alcohol and 1 liter acetic acid (93 per cent.) is allowed to flow in slowly. At first some ethyl ether goes over and then a liquid which contains, with considerable uniformity, 85 per cent. acetic ether. The reaction takes place between 130° and 135° ; at 145° already some sulphurous acid is produced. The yield is about 1350 grams or 78 per cent., which is 90 per cent. of the theoretical amount. With reference to the solubility of acetic ether in saturated calcium chloride solution is to be remarked that pure acetic ether is not dissolved, although it is if mixed with 90 per cent. alcohol. 1 volume acetic ether, 1 volume alcohol and 2 volumes calcium chloride solution give a homogeneous liquid.

The methyl acetic ether can be prepared exactly as the ethyl compound, but in the attempt to prepare the amyl acetic ether in an analogous manner side reactions were found to interfere. In order to study the proportional power of combination possessed by the two alcohols, the author allowed a mixture of 100 cc. methyl alcohol and 100 cc. acetic acid to flow into a mixture of 50 cc. sulphuric acid and 50 cc. ethyl alcohol. The first distillates contained essentially methyl acetate and the latter pure ethyl acetate. In the flask was found remaining nearly equal amounts of sulphuric and ethyl sulphuric acids, and in addition alcohol, acetic acid and some residual ethyl acetate.—*Bull. Soc. Chim*, vol xxxiii, pp. 350–351.

On Gelose.—Morin has studied the gelose of Payeus, contained in the so-called Chinese moss (ager agar). When its solution is cooled, even that of 1 in 500 parts of water, a colorless, transparent and stiff jelly is obtained, which, when heated with moderately strong nitric acid, yields mucic and oxalic acids. It dissolves on heating with acidified water without yielding a jelly on cooling. Its solution turns the plane of polarization to the left (a 1 per cent. solution in slightly acidified water placed in a tube 0.2 m. shows $-4^{\circ} 15'$). Boiling with weak sulphuric acid changes the rotation to the left into one of $4^{\circ} 10'$ to the right. The right-rotating substance so obtained reduces, with the aid of heat, alkaline copper solution, corrosive sublimate and gold chloride.

Gelose leaves 3.88 per cent. of ashes, and when air-dried contains 22.85 per cent. of moisture. When dissolved there also separates out

a flocculent mass amounting to 1.9 per cent.. Alcohol precipitates gelose, but it can not be obtained pure in this manner, as the precipitate contains some ash.—*Compt. Rend.*, No 90, pp. 924-926.

Absorption of Salicylic Acid by Wood.—Kolbe shows by a series of experiments that drinking water to which salicylic acid has been added in quantity of .05 gram to 0.2 gram per liter when kept in wooden casks, not coated on the interior with pitch, becomes spoiled in the course of several months, owing to the complete absorption of the salicylic acid by the wood tissue. The salicylic acid, it is true, cannot be detected in the woody tissue and is therefore apparently decomposed. The salicylic acid is similarly withdrawn from wine kept for a time in wooden casks.—*Four. f. pr. Chem.*, No. 21, p. 443.

Xanthogenic Acid a Precipitant for Albuminoids.—The preserving and antiseptic properties of carbon bisulphide and xanthogenic acid now definitely established appear, according to Ph. Zöller, to stand in a fixed connection with their behavior towards albuminoids. In fact xanthogenic acid proves to be a good precipitant for these latter. 5 to 10 drops of a 10 per cent. potassium xanthogenate solution added to 200 cc. of freshly pressed grape juice not only hinder all fermentation, but through the influence of the xanthogenic acid, liberated by the vegetable acids of the juice, all the protcin material precipitates out. This settles completely and the clear supernatant fluid, while containing the sugar in nearly unchanged amount, contains only traces of nitrogenous compounds. 75 cc. yielded on making a nitrogen determination no quantitative result. The author is still engaged in studying the character of the reaction.—*Ber. der Chem. Ges.*, vol. xiii, p. 1064.

Santonin contaminated with Strychnia.—Strychnia is stated to be a common impurity in commercial samples of santonin. Forquate Gigli recommends for its detection, in preference to Flückiger's method, the following process: 1 gram of the sample is placed in a small beaker, covered with a little distilled water and acidulated with a few drops of sulphuric acid. On agitating with a glass rod the strychnia dissolves, while the santonin remains insoluble. The liquid is filtered, the residue washed with a little water and the washing added to the filtrate, which is then distributed in several test-glasses and examined for strychnia by means of the usual reagents.—*Chem. News*, June 18, 1880, p. 283.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

A Substitution for Seneka Root is reported by E. Siebert, who claims that the substituted root had a general resemblance to seneka, without, however, possessing the characteristic peculiarities of the officinal root. The substituted root consists of dark brown (older roots) and almost yellow (younger roots) pieces, presenting like seneka a knotty, rough head, exhibiting numerous scars, showing where the stems had dropped off, and besides remnants of the latter still adhering. The pieces of root were longer and thicker than the genuine, but differed from the latter in not possessing the peculiar odor and taste, and principally in not being marked with the projecting, peculiarly twisted and contorted keel-like line, which extends along the whole length of genuine seneka. Transverse sections of the substituted and of the genuine roots greatly resembled each other. The author supposes the substituted root to be obtained from one of the many polygala species, indigenous to Central America.—*Pharm. Ztg.*, April 7, 1880, p. 208.

Sinalbin, the glucoside of white mustard seed, was isolated by Will and Laubenheimer by boiling the white mustard, previously deprived of its fat, with 85 per cent. alcohol for half an hour, expressing hot, allowing the glucoside to crystallize, washing it with carbon bisulphide, dissolving it in a little warm water, decolorizing with animal charcoal, precipitating with strong alcohol and recrystallizing the precipitate from alcohol. Sinalbin has the composition $C_{30}H_{44}N_2S_2O_{16}$, is readily soluble in water, very sparingly soluble in cold, but readily in about 3.3 parts boiling 85 per cent. alcohol; almost insoluble in absolute alcohol, and not soluble in ether and carbon bisulphide. It melts when heated, is decomposed at a higher temperature, liberating offensive-smelling vapors, is colored intensely yellow by the slightest trace of an alkali, and temporarily red by nitric acid. It reduces alkaline copper solution, and yields when boiled with soda-lye sodium sulphate and sodium sulphocyanate.—*Pharm. Ztschr. f. Russl.*, Feb. 15, 1880, p. 112.

Gardenin Resin was isolated by J. Stenhouse more than twenty years ago from the so-called "dikamale gum," the resinous exudation of *Gardenia lucida*, N. O. rubiaceæ, but was not analyzed satisfactorily until quite recently, when the author and Chas. E. Groves thoroughly investigated its properties, etc. The resin is yellow, crystalline, has an unpleasant odor resembling garlic, and contains 1 to 1.4 per cent.

gardenin, which is obtained by extracting with hot alcohol and putting the solution into a cool place, when it crystallizes, is purified, and then consists of dark yellow, brilliant crystals, melting at 163 to 164° and having the composition $C_{14}H_{12}O_6$.—*Ztschr. d. Allg. Oest. Apoth. Ver.*, April 10, 1880, p. 167, from *Annal. d. Chem.*

An efficacious Ergotin for hypodermic use was obtained by Finzelberg by powdering ergot freshly, removing the fatty substance by petroleum ether, then extracting with warm water (50 to $60^{\circ}C.$), concentrating the extraction at a very moderate temperature, separating the gummy portion with alcohol, separating the liquid by filtration, concentrating to the consistence of a thin mellago and transferring to a dialyser. The water is renewed several days in succession, and the extract, which has become a thinner liquid by absorbing water, and from which a considerable sediment has collected on the parchment-paper, is filtered and then evaporated to the consistence of a soft extract, when it answers all requirements of physicians.—*Pharm. Centralh.*, April 8, 1880, p. 123.

Thenardid, anhydrous sodium sulphate, was formerly only found in the mountains of Espartinas, near Aranjuez, in Spain, and in the desert Atacama, in Chili, but recently large quantities of it were also found in the vicinity of Barnaul (Gov. Tomsk, Siberia), and are used for preparing soda, being the best material in the world for this purpose, consisting, according to Dr. J. Biel's analysis, of sodium sulphate 99.67 per cent., sodium chloride 0.0618 per cent., water 0.2298 per cent. and insoluble (in water) matter 0.035 per cent. It is found in handsome rhombic, translucent crystals, which become cloudy by absorbing moisture when exposed to the air.—*Pharm. Ztschr. f. Russl.*, Feb. 15, 1880, p. 104.

An Extraordinary Fine and Dry Carbolic Dusting Powder, unaltered by age, containing $2\frac{1}{2}$ to 3 per cent. carbolic acid, used for dusting directly on open sores and ulcers by means of bellows, the tube of which terminates in a very fine wire sieve, through which the powder is forced, is made by Prof. Bruns by melting together at a moderate heat 60.0 colophony and 15.0 stearin, allowing the mixture to cool partially, adding while still liquid 25.0 carbolic acid and reducing the whole mixture into a uniform powder by triturating carefully with 700.0 to 800.0 precipitated calcium carbonate. When this powder is to be used for preparing a dry carbolic bandage, a mixture of 40 parts carbolic acid, 45 parts colophony and 15 parts stearin is triturated into a

fine powder with precipitated chalk in the proportion of 1 to 6.—*Pharm. Ztschr. f. Russl.*, March 1, 1880, p. 146, from *Berl. Klin. Wochenschr.*

Insect Powder, colored yellow with chrome yellow, was noticed by Dr. C. Grote, whose simple method of detecting the chrome yellow consists in igniting as much of the powder as can be put on the point of a knife with saltpetre, when a yellow fused mass is obtained, which, being dissolved in water and filtered, yields in the filtrate and residue reactions respectively of chromic acid and lead. The fraudulent addition was probably not only made in order to impart a brighter yellow color to the pure insect powder, but in order to prevent the detection of other probably not yellow inert additions.—*Pharm. Ztg.*, April 7, 1880, p. 208.

Concentrated Tincture of Insect Powder (*Tinctura pyrethri florum concentrata*), is highly recommended as an insecticide by Finzelberg, who prepares the tincture in the proportion of 1 part Persian insect powder to 10 parts absolute alcohol, and claims that in order to prove efficient, it is necessary to scatter it by means of a perfume atomizer. When thus used in a closed room all flies soon drop dead, while scattering it over linen, etc., acts as a protection against fleas, etc.—*Pharm. Centralb.*, April 1, 1880, p. 118.

Grimault's Indian Hemp Cigarettes are highly recommended for asthma, other affections of the breathing organs and various other diseases, consist almost altogether, as the French manufacturer claims, of Indian hemp and a little saltpetre, and are far superior to the ordinary remedies, which consist of the leaves of belladonna, of nicotina, or of paper—all impregnated with saltpetre, opium, or even arsenic. An analysis, made by Dr. H. Braun, proved, however, that Grimault's cigarettes consist chiefly, in contradiction to the manufacturer's statements, of belladonna leaves, contaminated (we might almost say) with a few fragments of cannabis, and of two other species of leaves, one of which greatly resembles the leaves of epilobium.—*Ztschr. d. Allg. Oest. Apoth. Ver.*, April 10, 1880, p. 168.

The Various Colors of the Shells of Bird's Eggs are products of two coloring substances, which Wicke considers identical with *biliviridin* and *bilirubrin*. The coloring matter consists in the outer layer of the shells, and separates in flakes when the egg-shells are moistened with hydrochloric acid. Alcohol dissolves these flakes, yielding various colored solutions: A sky-blue solution (with shells of

Turdus musicus, *Sturnus vulgaris*, *Sylvia phœnicurus*, *Ardea argentea*); a green solution without fluorescence (f. e. *Corvus corone*); a blueish-green solution with blood-red fluorescence (shells of *Larus canus* and *ridibundus*, *Sterna hirundo* *Scolopax*, *Hæmatopus*, *Tringa*); in rare cases a reddish solution with fluorescence. An attempt to isolate these coloring substances yielded sticky, dark green substances, but proved that they generally consist of a green or blue and a reddish-brown substance.—*Ztschr. d. Allg. Oest. Apoth.*, April 1, 1880, p. 152, from *Ber. d. Deutsch. Chem. Ges.*

Ostrich Feathers are bleached by immersing into a solution of 4 to 5 grams potassium permanganate in 1 liter of water, to which an equally strong solution of magnesium sulphate may be added, heating to not over 60°C., washing and ultimately immersing into sulphuric acid (1 to 2° Baumé), or still better into a solution of sodium bisulphide.—*Pharm. Ztschr. f. Russl.*, March 1, 1880, p. 151, from *Polyt. Notizbl.*

Cloth, Linen, Paper, Straw, etc., can be rendered fire proof (incombustible) by immersing them into a boiling solution of pure ammonium sulphate 8 parts, ammonium carbonate $2\frac{1}{2}$ parts, boracic acid 3 parts, pure borax 1.7 part and starch 2 parts, in water 100 parts—*Pharm. Ztschr. f. Russl.*, Feb. 15, 1880, p. 120.

As an Innocent but fully as Reliable Substitute for Wickersheimer's Poisonous Preserving Fluid Hager suggests the following:

R	Salicylic acid,	20.0
	Boracic acid,	25.0
	Potassium carbonate,	5.0
	Dissolve in hot water,	500.0
	Glycerin,	200.0
Then add	Oil cinamon, oil cloves, each	15.0, dissolved
	in alcohol,	500.0

This fluid is not poisonous, and possesses the desirable property of acting as an antiseptic, and also as a preventive and exterminator of moths and vermin, and is possessed of a pleasant odor. The borosalicylate may be used in connection with other solvents if desired.—*Pharm. Ztg.*, March 24, p. 178.

Cantharidal Collodion.—Lallier moistens 100.0 freshly powdered cantharides with 1 part of a mixture of 150.0 purified ether and 20.0 acetic acid, packs into a percolator, allows to macerate for 12 hours, slowly exhausts with the balance of the mixture, allows the resulting tincture to evaporate spontaneously in the open air at an ordinary temperature until it has lost $\frac{1}{10}$ of its weight, then dissolves gun-cotton in it in

the proportion of 2.25 to 100.0 tincture and adds 10 parts of castor oil and 0.5 Venice turpentine.—*Pharm. Ztschr. f. Russl.*, March 1, 1880, p. 147, from *Pharm. Ztg.*

The following New Formula for “Unguentum diachylon Hebræ” is published by A. Deringer:

Dissolve 200 grams lead acetate in 1 liter distilled water and 300 0 white Marseilles soap in $1\frac{1}{2}$ liter distilled warm water, filter both solutions, mix, wash the resulting precipitate frequently with distilled water, and after removing the moisture from it as much as possible, melt 1 part of it together with $1\frac{1}{2}$ part best olive oil on a steam evaporating apparatus and triturate into a white, smooth salve in a mortar, which then possesses all the excellent, mild and healing properties of Hebræ’s salve.—*Pharm. Ztschr. f. Russl.*, Feb. 15, 1880, p. 103.

An Elegant, Accurate and Neat Manner of Dispensing small Quantities of Mercurial Ointment is suggested by H. Huelsebusch, and consists in pouring the previously sufficiently melted ointment into glass tubes, allowing to cool, and then forcing them out of the tubes with a glass rod, when the ointment is obtained in sufficiently hard sticks, resembling lead plaster in appearance, any desirable weight of which can be readily cut off and dispensed.—*Pharm. Ztg.*, March 31, 1880, p. 195.

De Vrij’s Improved Method of Preparing Fluid Extract of Cinchona is as follows: 100 grams of the powdered bark of the trunk of East India Cinchona succirubra, containing at least 6 per cent. alkaloids, are mixed with 38 grams normal hydrochloric acid and 362 grams water, and are macerated for 12 hours, at the expiration of which 20 grams glycerin are added and the whole mixture is transferred to a percolator. When the clear percolate ceases to pass clear water is passed through the percolator until the percolate is only colored, but no longer rendered cloudy by soda lye, which usually is the case before 800 grams percolate are obtained. The latter is then evaporated to 100 grams, the obtained fluid extract thus corresponding in strength to the fluid extracts of the U. S. Pharmacopœia.—*Pharm. Ztg.*, March 27, 1880, p. 187.

A Fraudulent Substitution, on a large scale, of Cinchonina muriate for Quinia sulphate is again reported by Prof. X. Landerer of Athens, Greece, who states that all the bottles were marked “Sulphate of Chinine,” that the contents of several of them were analyzed by him and proved to contain not the slightest trace of quinia sulphate, that the substituted alkaloid was readily soluble in water and answered all the tests of cinchonina muriate.—*Pharm. Ztg.*, March 24, 1880, p. 178.

VARIETIES.

Hoof Ointment.—Very satisfactory results are said to have been obtained with the following ointment in the treatment of all diseases peculiar to hoofs, such as cracks, scratches, cuts, etc.:

R Benzoin, catechu, bone charcoal,	each	10 parts.
Reduce to a very fine powder and add:		
Pure carbolic acid,		8
Petroleum ointment,		100
Yellow wax,		10
Mix, with a gentle heat.		

—*Pharm. Centralh.*, Dec. 4, 1879, p. 453.

Pilocarpin in Skin Diseases.—Pick gives the result of his experience with pilocarpin in various skin diseases as follows: After a two-weeks course of pilocarpin in a case of alopecia areata, which had existed six months, there appeared fine white lanugo, and at the end of twelve weeks the growth of hair was restored. In ten cases of alopecia pityroides the result of the treatment was favorable. The writer concludes that the remedy may be depended upon to restore the growth of hair in cases where there is no strong hereditary tendency to baldness. (Consult "Courier," vol. ii, p. 356.) In a case of chronic intractable urticaria a cure was effected with one-tenth grain dose of the drug, twice daily. No effect was observed from its use in psoriasis; acute eczema was aggravated, while the chronic form was apparently benefitted under its administration. In pruritus cutaneus, and particularly in pruritus vulvæ, good results were obtained.—*Vierteljahr. f. Derm. u. Syph.*, Heft 1, 1880, from *Ibid.*

Benzoic Acid in Rheumatism.—Senator has employed this remedy in forty-six cases of polyarticular rheumatism. From a clinical point of view it much resembles salicylic acid: Salkowski attributes to it the same anti-putrescent and stronger anti-fermentative properties. In order not to irritate the primæ viæ, moderate doses are to be given at first: 10 to 12 grams ($2\frac{1}{2}$ to 3 drachms) of benzoic acid; or better 12 to 15 grams (3 to $3\frac{3}{4}$ drachms) of benzoate of soda. The acid was given as a powder in wafers or capsules; the benzoate in 100 to 140 grams (3 to 4 oz.) of an aromatic draught, with or without syrup.

It may be considered a specific for rheumatism, though in a less degree than salicylic acid. As a rule, the latter is more prompt in its action, though in some cases where that failed the benzoic acid succeeded. No relapses nor cardiac complications have been observed. Benzoic acid seems to have no tendency to irritate the stomach or bowels.—*Geneeskund Cour. der Nederl.*, *La Presse Méd. Belge*, April 25, 1880, from *Ibid.*

Metaphosphoric Acid.—W. C. Grigg pronounces metaphosphoric acid a much more delicate test for albumen than nitric acid. The acid should be freshly made and dissolved without heat. A piece of about the size of a pea is to be dissolved in

a drachm of distilled water. The urine may be added to the solution or *vice versa*. If there be a trace of albumen the urine will immediately become turbid and of a milky-white color.—*Brit. Med. Journ.*, May, 1880, from *Ibid*.

Strychnia Successfully Antidoted by Hydrate of Chloral.—A case is reported in the "British Medical Journal" by George Gray, M. D., of strychnia poison successfully antidoted by chloral hydrate. The patient bought 20 grains of strychnia to poison rats with. He stirred it in a glass of whiskey and drank it all. Dr. Gray administered 2 drachms of chloral hydrate in solution, with much difficulty, but it had the desired effect. Two days afterward he was at his usual work.—*N. Carolina Med. Journ.*, July, 1880.

Quinamine.—Again the medical world has been presented with a new conception called Quinamine, said to be uncrystallizable quinia, and comprising other valuable constituents of Peruvian bark. When will this diabolism cease, and when will the traffickers in new remedyism ever let up in their schemes of crowding into the van their tiresome innovations, and endeavoring to compel physicians to prescribe and use their silly and useless nostrums? It is remarkable what untiring elasticity and inexhaustible scope some well-known and favorite drugs possess, and especially it is the case of cinchona bark. Since its introduction as a curative agent its natural features and general characteristics have been contorted into numberless and nameless shapes, with a product of fantastic alkaloids, peculiar approximations, and other active principles, until the individual notation would make a list as prolific as the tail of a comet. We have quinidia, cinchonidia, quinamina, apoquinamia, quina-midia, quinamica, monoquimamica, monocinchonidia, and all the twisted idioms of our extensive tongue have savored this boundless and seeming inexhaustible dish of unrelishable dialect. And now another has displayed and unturled its feelers for patronage in this principle called Quinamine, claiming to embody all the virtues of Peruvian bark, and at an alarming low value. We trust that physicians will resent and disfavor this classic procession of meaningless remedies and give no encouragement to the missionaries sent out for their introduction; for it is through the medium of our medical men that we shall thwart the bombardment of these damaging delusions.—*Western Lancet*, July, 1880.

Chian Turpentine.—Much interest has been taken in the subject of Chian turpentine, from an important series of investigations conducted at the Queen's Hospital, Birmingham, as to a new method in the treatment of cancer by Mr. John Clay, obstetric surgeon to the hospital. This terrible malady has always been ungovernable by medical treatment, but the inquiries and experiments, led by Mr. Clay, introduce the belief that by the use of this carbo-hydrate the speedy disappearance of what is usually termed the cancerous infiltration can be obtained, and thereby the further development of the tumor arrested. Doubtless every pharmacist has already learned from his books of reference that it is the product of the terebinth, pistacia terebinthus, a tree found in all parts of the Mediterranean; naturally it is of a very stiff consistence, and quite often firm and solid. It has a cloudy and sometimes opaque appearance and of a greenish-gray or greenish-yellow hue. Its odor is very

feeble, but when enclosed in a glass vessel it preserves a strong, agreeable scent analogous to that of fennel or elemi. Prof. Clay published formulæ for its administration, as pills, ethereal solution and emulsion. The pills consist of 3 grains of Chian turpentine and 2 grains of sulphur in each. These do not keep their shape well, but are said to be digestible. The ethereal solution is made by dissolving 1 ounce of the turpentine in 2 ounces of sulphuric ether, and the emulsion is directed to be made with one-half ounce of this ethereal solution, 4 ounces mucilage of tragacanth, 1 ounce simple syrup, 40 grains of sulphur and water to 16 ounces. If Dr. Clay's discovery proves all that it agrees to, Chian turpentine will soon be worth its weight in gold. The supply of this particular turpentine being limited, and the disease universal, it is difficult to say where the price will end, until other sources of supply be found or created. As a discovery it should for the present be taken *cum grano salis*.—*Ibid*.

The Stigmata of Maize.—We copy from the London Practitioner's translation from the "Progrès Medical" the following on *corn-silk* as a diuretic. Some months ago we asked our readers to investigate this new remedy when the roasting-ear season came. It is now with us, and we hope some of our friends will report to us the results of their trials with it:

It is hardly a year since this remedy was first introduced into the ordinary routine of practice, and yet it may not be uninteresting to make an abstract of some of the papers which have been published in regard to it. Prof. Castan, at the Montpellier meeting, called attention to the stigmata of maize as a remedy which he had long known and which he had found to be of great use in gravel and nephritic colic. In the latter disease there ensued, after the administration of the drug, a marked decrease in the painful symptoms, and he therefore supposed that the stigmata acted less as a diuretic than as a local anesthetic. Prof. Denucé, of Bordeaux, obtained the most favorable results from its use in vesical catarrh, in which it appears to possess an elective action on the mucous membrane of the bladder. Dr. Pons, of Nérac, and Dr. Queirel, of Marseilles, had also frequently employed the stigmata of maize. M. Queirel observed that the pain was greatly alleviated in nephritic colic after the use of the remedy, but the urine was at the same time markedly increased in quantity. At the Therapeutic Society M. Constantin Paul stated that he was not convinced of the diuretic properties of the stigmata, although one of his colleagues had obtained some very striking results, the quantity of urine being in one case of dropsy increased from five to fifteen hundred grams after the ingestion of three spoonfuls of the syrup. Dr. Landrieux has arrived at the following conclusions, based on a considerable number of observations:

1. The various preparations of the stigmata of maize are of use in modifying the secretions of the urinary tracts. They may also be considered to possess a distinctly diuretic action.
2. Diureses is rapidly produced and the increase of urine is very marked after three or four days.
3. The diuretic effects are observed not only in diseases of the organs concerned in the urinary secretion, but also in the affections of the vascular system (diseases of the heart, blood vessels, etc.).

4. The pulse is regular, the arterial tension is increased, while the venous pressure is diminished.

5. The remedy produces no disturbance of the nervous or digestive systems. The tolerance of the drug is complete and absolute, while in chronic cases its administration may be continued for three to six months without inconvenience. The different results which the use of the stigmata of maize has given at the hands of different observers appears to be due in a large measure to the fact that the strength of the extract varies according to the nature of the soil, to the climate, to the time, to the mode of picking and to the manner of drying the stigmata. The formula for the preparation of the syrup is not yet fixed, since the quantity of the active principle varies in different samples of the stigmata. The Pharmaceutical Union adopts formulæ which contain in one case six and in another twelve grams of extract to the kilogram of syrup. The latter receipt is based on the assumption of a strength of 12 per cent. This quantity appears, however, to be too small, since the best samples of stigmata yield 25 to 30 per cent. of extract, or on an average 27.5 per cent. The kilogram of syrup will therefore contain 27.5 grams with this strength (27.5 promille). The daily dose of the syrup will be two to four spoonfuls, representing about one to two grams of the extract. In all cases the syrup should be employed in preference to an infusion of the stigmata of maize.—*Louisville Med. News*, July 3, 1880.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

[THE following notice should have appeared in the last number, but was crowded out by other matters.]

Kansas State Pharmaceutical Association.—Pursuant to a call circulated some time ago, a convention of the druggists of the State was held in Topeka, Kansas, June 24; over fifty delegates were present, the session being held in the Court House at 11 o'clock.

A temporary organization was effected by the election of W. C. Johnson, of Manhattan, President, and F. E. Holliday, of Topeka, Secretary.

At the afternoon session a permanent organization was effected by the election of the following officers:

President, R. J. Brown, Leavenworth; First Vice President, B. W. Woodward, Leavenworth; Second Vice President, W. C. Johnson, Manhattan; Secretary, G. A. Chapman, Atchison; Assistant Secretary, F. E. Holliday, Topeka; Treasurer, J. G. Northcraft, Abilene; Executive Committee—Geo. A. Eddy, Leavenworth; J. W. Scott, Iola; H. K. Rowley, Topeka; W. A. Stamford, Florence. Delegates to American Pharmaceutical Association—G. A. Chapman, Geo. A. Ferdinand, H. C. Trickey, Oscar Seitz, T. F. Sturtevant.

Much of the evening session was spent in a discussion of a proposed law to be urged for passage at the next session of the Legislature. The draft is too lengthy for publication.

A committee on legislation was appointed, as follows: B. W. Woodward, A. E. Barnes, Prof. Patrick, T. F. Sturtevant, H. D. Trickey, T. J. Bokman, Mr. Spangler and Dr. Fleming.

The committee on legislative matters presented for the consideration of the Association a line of action, as follows:

1. To procure the passage of a law restricting and defining the practice of pharmacy, similar in terms to a proposed law for the Illinois association, which accompanied the report, except that the Board of Health therein proposed be superseded by an Examining Board of five, to be appointed by the Governor out of twenty pharmacists recommended by the Association; also that a certificate of graduation from the Kansas College of Pharmacy or that of any other reputable college of pharmacy, shall entitle the holder to a certificate from the State Board.

2. The incorporation in said act of a provision that all the registered pharmacists in the State shall be authorized by law as a legitimate part of their business to sell liquors for medical, sacramental, scientific and mechanical purposes.

3. The passage of the following resolutions relative to the establishment of a Kansas college of pharmacy.

Resolved, That it is the sense of this Association that there should be in the State of Kansas a college of pharmacy for the education of young men intending to become druggists, who in the absence of such an institution are obliged to go into other States, at no small expense, to obtain that which should be furnished within the limits of our own Commonwealth.

Resolved, Therefore, that the Executive Committee of this Association be instructed to prepare and present a memorial to the Legislature of the coming winter, setting forth the present lamentable condition in relation to the dispensing of drugs, medicines and poisons, and the protection which public safety demands in this regard, and praying that body to appropriate the sum of \$1,000 annually for the establishment and continuance of a chair of pharmacy and materia medica in the State university, such chair, the chair of chemistry and that of botany together to constitute the State college of pharmacy.

Mr. Leis moved that the Executive Committee be instructed to incorporate the Association, provided it is found practicable. Adopted.

The bond of J. G. Northcraft, Treasurer, was approved.

Mr. Northcraft offered a resolution to the effect that he be empowered to advance money, not exceeding \$100, to the secretary with which to pay bills, he to account for the same. Adopted.

The Executive Committee recommended the election of certain absent gentlemen as members, and the convention adopted the recommendation.

Topeka was unanimously selected as the place of the next meeting.

Cincinnati College of Pharmacy.—We learn from a Cincinnati paper that a movement has been on foot for some time past looking to a consolidation of the Cincinnati College of Pharmacy with the University located in that city, and that the project received the favorable consideration of the University Board, and that it also had some strong supporters among the active members of the College of Pharmacy. Subsequently a meeting of the College was called to consider the action of the Board of Trustees, especially in the matter of electing trustees and fixing their compensation; after considerable discussion the action of the Board was annulled and the old faculty were appointed at the old salaries.

An election for four trustees was also held at the same time. Messrs. Feemster, Græger, Heun and Reum were elected.

EDITORIAL DEPARTMENT.

American Pharmaceutical Association.—We feel that the near approach of the sessions of our National Pharmaceutical Association requires a notice of the fact, and also of the most interesting matters pertaining to its usefulness and its existence.

Like every other institution, it cannot flourish without money, and this, it is well known throughout the membership of the Association, is lamentably scarce, paying its way each year only by collecting the dues of the ensuing year. It is easy to see that the state of bankruptcy cannot be far distant; yet still the auditing committees have, till last year's meeting, generally merely reported the treasurer's account correct, not even noting the fact that the balance is really made up from the dues of the coming year. Whether the action taken at the meeting last year at Indianapolis will prove to be the cure it was designed will soon be known. The action of the Association in appointing a committee to induce members of the trade to connect themselves with us, if generally responded to, will help the finances of the Association, besides giving relations to young members of the profession by which an increased interest in our calling will most naturally ensue. With a sincere hope that the best interests of the Association will be carefully considered and judiciously guarded, we urge a large attendance at Saratoga.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

An Introduction to Pharmaceutical and Medical Chemistry. By Dr. John Muter, M.A., F.C.S., F.I.C. Second edition. London: W. Baxter, Kensington Cross, S. E. Philadelphia: Presley Blakiston, 1012 Walnut street.

It is with a great deal of gratification we notice a second edition of this valuable work, and more particularly since it is a *new* edition, not a mere revise, but arranged in a manner that is quite different from the former, and, in our judgment, much better adapted to the wants of the learner.

Part I, which occupies 398 pages, is devoted to theoretical and descriptive chemistry. Chapter 1 is introductory; treats of matter in various states; analysis and synthesis; the elements and their symbols; and a preliminary notice of the four elementary substances—oxygen, hydrogen, nitrogen and carbon.

Chapter 2 treats of theories, chemical action and the modes of expressing the same by formulæ and equations. Under these theories the laws of combination are fully and most clearly explained; chemical action is next explained; combination by volume; atomicity is next treated of, and then graphic formulæ in their connection with the doctrine of atomicity. Radicals, acids and bases are in turn explained, and then the formulation of salts in connection with the knowledge of atomicity.

Chapter 3 treats of simple basylous radicals—the metals used in pharmacy—under the classes of monads, dyads, triads, tetrads, pentads.

Fluorine and chlorine, with their compounds most used in pharmacy, occupy the fourth chapter. Oxygen and its compounds, with simple basylous radicals, fill the sixth chapter. Sulphur and its compounds are treated of in Chapter 7. Carbon with its compounds are the subjects treated of in Chapter 8. Chapter 9 treats of

boron, silicon, selenium and tellurium. Chapter 10 treats of nitrogen and its compounds. Chapter 11 treats of phosphorus and its compounds; these combinations, which have become so popular in medical practice of late years, are described quite fully. Chapter 12 is devoted to the preparations of arsenic. Chapter 13 treats of the hydrocarbons and their derivatives. Chapter 14, the alcohols. Chapter 15, carbohydrates, which really belong to the alcohols. Chapter 16 treats of the organic acids. Chapter 17, the ethers. Chapter 18, the aldehyds, ketones, etc. Chapter 19 treats of ammonia derivatives. Chapter 20, the glucosides. Chapter 21, albuminous bodies.

Part II treats in the first chapter of the processes employed by the chemist in his daily work; in the second chapter, the detection and separation of the metals; in the third chapter, the detection and separation of the acidulous radicals; in the fourth chapter, qualitative analysis in examining official salts; in the fifth chapter, qualitative analysis in the detection of unknown salts; in the sixth chapter, detection of alcohols.

Chapter 7 treats of toxicology. Chapter 8, of volumetric quantitative analysis. Chapter 9, of gravimetric quantitative analysis. Chapter 10, of ultimate organic analysis. Chapter 11, of special processes in analysis.

We have thus particularly asked the attention to the above lists of contents, as so many are desirous of the succinct and withal exact methods adopted by Dr. Muter in his treatise. We can only express the hope that it will be largely used.

T. S. W.

The Skin in Health and Disease. By L. D. Bulkeley, M.D. Philadelphia: Presley Blakiston, 1012 Walnut street.

This little manual—one of the series of American Health Primers—treats of a subject upon which there is a great amount of popular ignorance, and in view of this the treatise was prepared, in the hope that its perusal would tend to correct the ignorance and show the necessity of seeking proper advice. Of course any opinion of our own upon the methods of treatment would be entirely out of place.

Supplement to the American Dispensatory. By John King, M.D., and J. U. Lloyd. Cincinnati: Wiltach, Baldwin & Co.

This is the title of a work which embodies notices of most of the new remedies selected to a great extent from the native drugs of our country. The American Dispensatory has long been regarded as an *authority* by the class of physicians who style themselves as Eclectics, and in June of last year their National Association resolved to adopt it as their standard authority. The work is a very closely printed royal octavo of 302 pages; the index has nearly, if not quite, 1,500 references; among these we note many which have lately been introduced to the attention of medical men. The work is one that should be in the library of every pharmacist who would keep himself well informed upon the new remedies which have been introduced.

The Student's Dose Book and Anatomist Combined.—Detroit: "Leonard's Illustrated Medical Journal," 1880. Price \$1.

This little work is divided into two parts, the first of which, issued separately, has attained to the twenty-fifth thousand, and the second to the tenth thousand, designed evidently for the medical student. It can hardly be considered within our province to criticise.

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OCTOBER, 1880.

ACID PHOSPHATES.

("Liquor Acidi Phosphorici," "Liquor Acidi Phosphorici Comp.")

BY JAMES T. SHINN.

In the Philadelphia "Medical Times," Aug. 14th, 1880, is a paper by Dr. Wm. Pepper on the administration of Phosphoric Acid, in which the use of Horsford's Acid Phosphates is spoken of and its stated composition given, and two other preparations, with titles as above, are recommended as worthy of extended trial. Their component parts are mentioned, but not the manipulation in preparing them. The formulas are as follows:

Liquor Acidi Phosphorici (without Iron).

R	Calcii phosphat.,	grs. iii; or for Oi, 384 grains.
	Magnesii phosphat.,	grs. ii; " 256
	Potassii phosphat.,	grs. iss; " 192
	Syrupy phosphoric acid,	℥v; " 640 minims.
	Aquæ, q. s. ft.	fʒi; " 1 pint.

Liquor Acidi Phosphorici Comp. (with Iron).

R	Calcii phosphat.,	grs. iii; or for Oi, 384 grains.
	Magnesii phosphat.,	gr. ss; " 64
	Potassii phosphat.,	gr. $\frac{1}{4}$; " 32
	Ferri phosphat.,	gr. ss; " 64
	Syrupy phos. acid,	℥vi $\frac{3}{8}$; " 816 minims
	Aquæ, q. s. ft.	fʒi; " 1 pint

The syrupy phosphoric acid used contains about 60 per cent. of glacial acid, and is furnished by the chemists and druggists for manufacturing purposes.

As some pharmacists may have calls for the preparations in limited quantities and might not have all the phosphates in stock, a ready process by which they can be made in any apothecary shop is desirable. The bone phosphate of lime is not entirely soluble in phosphoric acid, and can readily be made from the carbonate: in 156 parts are 72 parts phosphoric acid and 84 parts lime, which latter are equivalent to 150

parts carbonate of calcium. The phosphate of magnesium consists of 72 parts acid and 60 parts of magnesia in every 132 parts of the phosphate. In 175.4 parts of phosphate of potassium are 72 parts acid and 94.4 parts caustic potash=138.4 of carbonate. The officinal phosphate of iron, which is always kept on hand, is freely soluble in diluted phosphoric acid, and may be added direct. From these proportions the following formula for a pint of each solution is deduced:

Liquor Acidi Phosphorici.

Carbonate of calcium,	369 grains	(156:150::384:369)
Magnesia (calc.),	116 "	(132: 60::256:116)
Carbonate of potassium,	151 "	(175.4:138.4::192:151.4)
Syrupy phos. acid (60 pr. ct.)	1721 "	{ 665 in combination: 1066=640 m free.
Water, sufficient to make 1 pint.		

Liquor Acidi Phosph. Comp.

Carbonate of calcium,	369 grains	(156:150::384:369)
Magnesia (calcined),	29 "	(132: 60:: 64: 29)
Carbonate of potassium,	25 "	(175.4:138.4:: 32: 25.2)
Phosphate of iron,	64 "	
Syrupy phos. acid (60 pr. ct.)	1705 "	
Water, sufficient to make 1 pint.		

Mix the acid with half a pint of water, add the phosphate of iron and stir until dissolved (for liq. ac. phos. comp.), then add gradually the carbonates of calcium, stirring until effervescence ceases and the freshly-formed phosphate is dissolved, and finally add the magnesia and carbonate of potassium; stir until dissolved, and make up the measure to one pint with water. On standing for several days a slight precipitate occurs, which may be prevented by slightly increasing the amount of acid.

The whole can be prepared in half an hour, less time than required to send to another druggist for it, and at a cost of less than 40 cents a pint, while Horsford's Acid Phosphate, at \$4.00 a dozen, will cost about 90 cents per pint. Besides securing a larger profit, the pharmacist will have the satisfaction of dispensing a preparation of whose composition he is sure and of his own production, and the physician will get what he prescribes.

These preparations taste about as acid as Horsford's, and do not vary much in specific gravity, liq. acid. phos. being 1.170, liq. acid phos. comp., 1.125 and Horsford's 1.121.

In Dr. Pepper's calculation as to the comparative acidity between

his solutions and dilute phosphoric acid he seems to have overlooked the fact that a minim of the syrupy acid weighs much more than a grain, its specific gravity being about 1.700; and taking one ounce of glacial acid in $12\frac{1}{2}$ fluidounces of diluted acid as the basis of calculation, it will be found that his preparations really contain rather more free phosphoric acid than similar volumes of the officinal dilute acid, though the difference will be probably of no importance in practice.

GLYCEROLE OF CINCHONA.

BY FRED. LOOS, JR., PH.G.

From an Inaugural Essay.

Although there are numerous liquid preparations of the cinchona barks there appear to be none which, for any length of time, remain perfect and reliable; they become more or less turbid, and in most cases a precipitate forms.

As this deposit is generally that extractive portion of the bark which contains a large percentage of its alkaloids, and therefore the part which is most sought after in medicine, it is evident that a large proportion of its active qualities are lost, and what the physician supposes is doing his patient the most good is ornamenting the sides of the "shop bottle" in some modern "palace of pharmacy." It seems that the solvents used in making the officinal preparations of the cinchona barks have not the power to hold in solution the above-mentioned principle, and on that account in a short time the liquids lose their transparency, and become cloudy.

Glycerin is not only an excellent solvent and preservative, but its blandness and agreeable taste render it acceptable in many cases where an alcoholic or vinous preparation is objectionable. By using glycerin I find that a beautiful preparation of cinchona can be made, which effectually holds in solution the extractive portion of the bark, and its clearness or quality is not affected in the least by age. In this respect I think it surpasses the present *Extractum Cinchonæ Fluidum* of the U. S. P., for in it there is invariably a very heavy deposit. Therefore, this fluid extract, which should and could be a very good one, has fallen almost entirely out of use.

The same complaint can be made of *tinctura cinchonæ* and *tinctura cinchonæ comp.*, so much used at present and prescribed by physicians everywhere.

The glycerole of cinchona, of which I am now about to speak, is a dense but very clear liquid, each fluidounce of which represents a troy-ounce of the bark; and, as there is not the slightest deposit of any kind, it contains all the virtues of the bark, coupled with those of the glycerin. The glycerole of cinchona rubra is a very dense liquid, of a rich, deep garnet color, while the glycerole of cinchona calisaya is considerably lighter in color and not so dense; this is evidently on account of the much greater quantity of extractive matter in cinchona succirubra.

As the process for making the glycerole of either cinchona succirubra or cinchona calisaya is exactly the same, one formula will suffice.

Take of Cinchona bark, in moderately-fine powder,	16 troyounces
Glycerin,	12 "
Alcohol,	3 fluidounces

Mix the liquids, and macerate the cinchona for five days, then pack in a conical glass percolator and displace with a menstruum composed of two parts of alcohol and one of water. Collect first twelve ounces and set aside, then continue percolation to exhaustion. Distil off the alcohol, or evaporate until reduced to $4\frac{1}{2}$ ounces, and when cold mix with the first 12 fluidounces; allow to stand a few days, and filter.

As stated above, each fluidounce of this preparation represents one troyounce of the bark, and therefore each teaspoonful represents 60 grains. Sixty grains of cinchona bark being rather a large dose, and one which is seldom prescribed, I have made a glycerole just half the strength, and find it equally as fine and much more convenient for prescribing. The process is the same as the one previously given, with the exception that in this case only one-half the quantity of cinchona bark is used, and therefore each teaspoonful represents but 30 grains of the bark, which is much nearer the average dose than the former.

The glycerole of cinchona is so intensely bitter that I have endeavored, by the use of licorice and several aromatics, to make a compound which, to some extent at least, would be pleasing to the taste; and, by compounding this with an equal bulk of the glycerole of cinchona, quite an agreeable mixture can be made.

Aromatic Glycerole of Licorice.

Take of Licorice root, in fine powder,	2 troyounces
Cinnamon, in fine powder,	1 "
Cloves, anise and caraway in fine powder, each,	2 drachms
Glycerin,	4 troyounces
Dilute alcohol,	sufficient quantity

Mix the drugs, and having moistened them with the glycerin and quantity sufficient of the diluted alcohol, pack in a conical percolator and displace with a menstrum of dilute alcohol; set aside the first three ounces, and continue percolation until exhausted. Evaporate until reduced to one fluidounce, and when cold mix with first percolate, and filter.

Aromatic Glycerole of Cinchona.

Take equal bulks of glycerole of cinchona and aromatic glycerole of licorice; mix them, and filter if necessary.

Any of the above-mentioned glyceroles can be reduced to any desired strength by diluting with a menstrum composed of two parts of alcohol and one of water. Should the reduced preparation show any inclination to precipitate, it is advisable to add a small portion of glycerin to the menstrum used in making the dilution.

QUILLAIA TOOTHWASH.

BY ALEXANDER E. BENNETT, PH.G.

From an Essay on the Uses of Glycerin.

An excellent toothwash containing glycerin is made as follows:

Take of	Soap bark, ground,	.	.	.	4 oz.
	Glycerin,	.	.	.	3 oz.
	Diluted alcohol,	.	.	sufficient for 2 pints	
	Oil of gaultheria, oil of peppermint, each,	.	.	20 drops	

Macerate the soap bark in the mixture of glycerin and diluted alcohol for three or four days, and filter through a little magnesia previously triturated with the volatile oils.

Thus made, a much better preparation is obtained than by macerating the bark in the dilute alcohol, and adding the glycerin afterwards.

ABSORPTION OF MOISTURE BY GLYCERIN.¹

BY GEORGE ELI WILLIAMS, PH.G.

From an Inaugural Essay.

The property possessed by glycerin of absorbing moisture is well known. To determine its rapidity under different circumstances the following experiments were undertaken :

¹ See also "American Journal of Pharmacy," 1879, p. 313 and 513.

1. 100 grams of glycerin, spec. grav. 1.25, were placed in each of four vessels of about the capacity of 200 cubic centimeters and of the diameters given in the table. These vessels were placed in the damp atmosphere of the cellar, September 1st, and weighed monthly.

Diameter.	Weight.				Monthly Increase.			
	Oct. 1.	Nov. 1.	Dec. 1.	Jan. 1.	Oct.	Nov.	Dec.	Jan.
2.5 cm.	102 gm.	103.7 gm.	103.8 gm.	104.1 gm.	2.0	1.7	.1	.3 per ct.
5.0	116	118	119.25	122	16	2	1.25	2.75
7.5	135	138.5	142.7	147.5	35	3.5	4.2	4.8
10.0	150	152.7	155.25	158.5	50	2.7	3.25	3.25

2. 100 grams of glycerin, spec. grav. 1.25, in a vessel 5 cm. in diameter and of 200 cc. capacity, and 100 grams of distilled water in another vessel of the same size and shape, were placed in a large jar which was then closely covered. On weighing the vessels monthly, the glycerin had increased and the water decreased, as shown by the table.

	Weight.								
	Oct.	Nov.	Dec.	Jan.					
Glycerin, 108 gm.	112	gm.	114	gm.	115.7 gm.	Increase, 8	4	2	1.7 pr ct.
Water, 90	82.5		75.5		68.3	Decrease, 10	7.5	7	7.2

THE NEW ANTIDOTE TO ARSENIC.

BY PHIL. HOGLAN, PH.G.

In the JOURNAL for August, p. 430, a formula is given for the preparation of the hydrated sesquioxide of iron, which Dr. McCaw recommends in preference to all others for two reasons, viz.: it forms the surest antidote, and the ingredients are always accessible. By consulting the formula the reader will see that the second reason is plain, and it was for the purpose of testing the accuracy of the first reason that the following experiment was conducted. I prepared the antidote as directed by mixing the bicarbonate of sodium and the water and adding the tincture of iron; the mixture was placed on a filter and allowed to drain for a short time when a thick magma was left. A small quantity of this magma was mixed with a solution of arsenic containing half a grain and, after stirring the mixture and filtering, *not a trace of arsenic could be discovered* in the filtered liquid by sulphuretted hydrogen, or by Marsh's test, thus demonstrating that the formula in question produces an antidote, which is among the surest, if indeed, not the surest of all antidotes.

While on the subject of antidotes to arsenic, I was induced to try the efficacy of the hydrate of magnesium recommended as an antidote by Bussy, though disapproved by others (U. S. Dispensatory, 14th ed., p. 30). The National Dispensatory, 2d ed., p. 887, states: "As an antidote to arsenious acid freshly precipitated magnesia ranks next in value to freshly prepared sesquioxide of iron." I dissolved about an ounce of sulphate of magnesium in a little water, gently warming the mixture. Water of ammonia was then added in slight excess and the mixture placed on a filter and allowed to drain. A portion of the magma left on the filter was mixed with a solution of arsenic; as in the experiment with the sesquioxide of iron, after stirring the mixture and filtering, Marsh's test gave *not the slightest evidence* of arsenic in the filtered liquid, thus showing that the hydrate of magnesium freshly prepared is an excellent antidote to arsenic, and possesses also the advantages claimed by Dr. McCaw for the sesquioxide of iron, viz.: that the ingredients, epsom salts and hartshorn are not only on hand in the apothecary shop but are frequently kept in the family, thereby insuring the preparation of the antidote in time.

Newcomerstown, O., August 20th, 1880.

PHARMACEUTICAL NOTES.

BY R. F. FAIRTHORNE, PH.G.

Duboisina, Eserina, Pilocarpina.—Thinking that perhaps a concise account of these alkaloids, derived from various journals, personal observation and other sources, might be of some interest, I have collected as much information as I could concerning them.

Duboisina is obtained from an Australian tree-like shrub of the natural order solanaceæ, an order furnishing several powerfully poisonous and narcotic active principles. It bears a close resemblance to atropia and hyoscyamia, yet differs from them in several particulars. According to Mr. Gerrard it possesses greater neutralizing power than atropia and is more soluble in water. When heated with strong sulphuric acid a disagreeable odor results, resembling butyric acid, whilst atropia treated in the same manner yields a pleasant aroma. The sulphate is the salt most used and is deliquescent. The alkaloid as obtained at present is a viscous extract-like mass, apparently uncrystallizable. Its therapeutic effects are similar to those of atropia, but more quickly appear and disappear. Dilation of the pupil is quickly produced by

solution of the sulphate of duboisina, and a solution containing 4 grains to the ounce has been known to produce dizziness in a few minutes after application to the eye. Like the active principle of the belladonna, duboisina also has the power of arresting or controlling profuse perspiration, and can be used with decided effect for this purpose when injected hypodermically, $\frac{1}{60}$ of a grain being usually sufficient.

Eserina is obtained from the Calabar bean and appears to represent the active principles of that substance. It is obtained by treating the powdered beans with alcohol, acidulated with tartaric acid, evaporating the solution to an extractive consistence, dissolving this in cold water, filtering to separate resinous substances, agitating with ether, removing the ether and adding bicarbonate of potassium in slight excess to the aqueous solution, agitating again with ether, which will now take up the liberated eserina and upon spontaneous evaporation will yield the alkaloid. When pure it crystallizes in thin rhombic plates, nearly white, or of a slightly rosy tint. The sulphate is very deliquescent. Its solutions are characterized by becoming red upon addition of an alkali, or if heated with ammonia and evaporated to dryness a beautifully blue coloring substance is produced, which is very soluble in water. If to this an acid is added a dichroic liquid is produced, being violet by transmitted light and carmine red by refracted light. Eserina sulphate, in solution, is used as an application to the eyes and produces contraction. The strength of the solution is generally 1 part to 1,000 or to 800, and as it rapidly alters, soon becoming red, it should be made only in small quantities. A solution in glycerin might possibly keep better. The physiological action of eserina is antagonistic to belladonna. The alkaloid has been used with success in cases of poisoning by the latter drug.

Pilocarpina, the active principle of jaborandi, is obtained by adding an alkali to an aqueous solution of the alcoholic extract, agitating with chloroform and evaporating. It appears to be uncrystallizable, is an oily, light-yellow liquid. It forms, however, crystallizable salts with a number of acids; composition, according to Kingzett, $C_{23}H_{34}N_4O_4$. The salt most used is the hydrochlorate, which occurs in white, feathery crystals and is very deliquescent. Solutions of this salt generally produce contraction of the pupil when applied to the eye, unaccompanied by irritation, on which account it may replace the use of eserina in some cases. Hypodermically injected in doses of from $\frac{1}{5}$ to $\frac{1}{2}$ a grain it produces profuse perspiration and salivation, and can replace

the administration of jaborandi by the mouth with the advantage that, when thus used, it does not cause nausea. Its action on the skin is more prompt and certain than that of the plant, owing probably to varieties of jaborandi containing variable proportions of the alkaloid, in the same manner that quinia is found more reliable than Peruvian bark. Pilocarpina is antagonistic in effect to atropia and corrects the dryness of the throat and mouth, which occurs when preparations of belladonna are used. One peculiar effect it possesses is that, when its solutions are applied to the eye, only near objects can be observed.

Dried Salts.—The inconvenience attending the dispensing of such salts as contain considerable proportions of water, when prescribed in the form of powders, has led me to dry several of such as are in most common use, namely: Sulphate of magnesium, sulphate of sodium, phosphate of sodium and sulphite of sodium, which were dried below 120°F., and after being kept near that temperature for four or five days and finding that they ceased to lose weight I found that

400	grains of sulphate of magnesium	were reduced to	355	grains.
400	“ “ sodium	“ “	180	“
400	“ phosphate of sodium	“ “	235	“
400	“ sulphite “	“ “	220	“

Therefore, if 40 grains of sulphate of magnesium is called for in powder, they can be replaced by 35½ grains of the dried salt, 40 grains of phosphate of sodium by 23½ grains dried; 40 grains of sulphate of sodium by 18 grains dried, and 40 grains of sulphite of sodium by 22 grains dried. Having so often met with difficulty in reducing the undried salts to fine powder I thought that the above information might be of some service to others.

ON THE RESIN OF LEPTANDRA.

By J. U. LLOYD.

Read at the twenty-eighth meeting of the American Pharmaceutical Association at Saratoga, and communicated by the author.

Leptandrin of commerce varies in appearance from two reasons:

1. Different fineness of powder.
2. Difference in composition.

If an alcoholic tincture of *Leptandra Virginica* be evaporated to the consistence of a thick syrup and this be poured into cold water a black tarry substance separates. This, if washed with pure cold water, finally becomes tasteless, and, if it be dried, constitutes the article

above named. This has a deep black color and breaks with a shiny fracture. It resembles much in appearance asphaltum. The powder produced from it varies in color in accordance with its fineness, becoming of lighter shade as comminution progresses. This is the main reason for the difference in the color of the resin (by resin is understood the precipitate before mentioned), and it may cause powders from the same lump to vary considerably.¹

Sensible Properties.—If the precipitate of which I have been speaking were “Leptandrin of commerce” there would be no very remarkable difference in the appearance of the various lots. The odor would be the same and all specimens tasteless, or nearly so. There is no official process for making “Resin of leptandra.” There is no preparation recognized by the Pharmacopœia under the name of *leptandrin*. The question arises: Is leptandrin of commerce the powdered resin to which article the name was originally applied by Wm. S. Merrell? In my opinion the majority of physicians who use “leptandrin” do not recognize the resin as the active principle of the root. Why should we take it for granted that manufacturers prepare the article, labeled *leptandrin*, by precipitation of the resinous substances? Prof. John King did not make his original preparation from the root of *Leptandra Virginica* in this manner. He informs me that he forms his opinion of the therapeutical value of *Leptandra Virginica* from the use of a mixture, dried of aqueous and of alcoholic extracts.

Resin (?) of Leptandra, or leptandrin, was discovered by Wm. S. Merrell about 1850. We may well suppose that the value of podophyllum resin (podophyllin) and the object of improvement led Mr. Merrell to the precipitation of the resin of leptandra and to the supposition that it (the resin) would prove to be the medicinal principle of *Leptandra Virginica*. This latter is admitted to have been a mistake, for very few eclectic physicians desire the resin, and the best authorities have decided against it.

I am of the opinion, furthermore, that very little of the “Leptandrin of commerce” is the resin, and that the difference in “sensible properties” of various lots may be ascribed to difference of composition. Manufacturers desire to prepare the best representative of the root, and as the *resin* fails to answer, they seek for other principles and other

¹Seven samples, powdered from one piece and sifted through sieves of different fineness, were exhibited.

means of manipulation, and label the result "Leptandrin."¹ Thus, I conclude that: "The Leptandrin of commerce" varies much in appearance and in "sensible properties" from the fact that it is of different degrees of fineness and of various compositions.

"*What is the best process for the preparation of the resin?*" Resin of leptandra exists as such to the extent of six per cent. (average of 3,000 pounds) in well dried root of not less than one year's age after collection. It is a recognized fact, that the yield of resin increases with the age and exposure of the root after collection where water, simply, is employed as a precipitant, and for this reason the root of two or more years of age is desirable. If the powdered root be percolated with alcohol and the percolate evaporated to a syrupy consistence, and this be poured into a larger quantity of cold water, a semi-solid substance settles. This, when well washed and dried, is the so-called resin. If the water which was used as a precipitant of the resin be examined it will be found very bitter, in consequence of the presence of the bitter principle, first noticed by Prof. E. S. Wayne (1856) and afterwards by Prof. F. F. Mayer (1863). The latter gentleman ascribed to it the properties of a glucoside, and I think his views will be supported. If five per cent. of sulphuric acid be mixed with the precipitating liquor after decantation from the resin, and the mixture be permitted to stand some weeks, the bitterness disappears, and a quantity of resin, similar in appearance to the original precipitate, is produced. If, however, the sulphuric acid and the precipitating liquid be mixed and then boiled together from thirty to sixty minutes, the reduction takes place at once, the bitterness disappears and resin results as *one* product.²

This would indicate that the bitter principle is a glucoside, and that the resin is a product of its decomposition, although I have not experimented regarding the corresponding production of glucose. That this resin is thus formed in a considerable amount may be seen by specimen shown, which is (12 lb.) the result of a 1,000 pound batch of leptandra. In making this lot the overlying liquid was simply decanted from the precipitate and it may have contained a small amount of mechanically

¹ Leptandra is valued by many for its laxative properties. The principle which imparts to the root this effect has never been identified. L.

² This cannot be taken as conclusively pointing to the formation of the resinous substance from the bitter principle. It may be that the resinous matter is held in a state of minute suspension by the liquid, or even is in actual solution. The subsequent manipulation with the acid solution may simply throw it down. L.

divided resin which refused to settle. From the foregoing it would be obvious, that if the object be to obtain the greatest possible yield of resin the best process will be to obtain resin from the glucoside also.

Formula.—Extract the root of leptandra (properly powdered) by means of alcohol. Evaporate the percolate to the consistence of a thick syrup, and pour the result, with stirring, into ten times its bulk of cold water; decant the supernatant liquid, add to it 5 per cent. of sulphuric acid, boil until the bitter taste disappears, and then wash separately the two resins with water and dry them, after which mix and powder them. To dry the precipitated resin, place in a vessel and expose, with frequent stirring, to a steam bath until it is of such a consistence as to break when cold; then break it into small pieces, and finish the drying by exposing to the air. The resinous substance obtained by means of sulphuric acid may be dried by simple exposure to the air. According to many authorities resin of leptandra is inert. I am decidedly in favor of a dried alcoholic extract, although such must contain a considerable amount of glucose, which exists in the root in large amount, and is extracted by alcohol to a considerable extent. The trouble experienced in drying an alcoholic extract (recorded by Dr. T. L. A. Greve) without the use of foreign substances, and with full preservation of its characteristics, renders its preparation by ordinary methods tedious and somewhat difficult. I have no trouble with leptandra when I pursue the following process:

Extractum Leptandræ Alcoholicum.—Precipitate the evaporated alcoholic extract by means of water in the manner before directed, and evaporate the liquid to the consistence of a thick solid extract. Dry the resin, powder it, and stir this powder into the solid extract and thoroughly incorporate them. The thick mass is then to be picked into small pieces, spread in layers in a drying closet and dried by a current of warm air, then powdered. From the foregoing preparation the full effects of leptandra root may be expected.

It will be noticed that I use the dry resin as an absorbant instead of carbonate of magnesium or other extraneous substance. This, or a similar preparation, might well be recognized by our Pharmacopœia. The preparations which are sold under the name of leptandrin constitute an important article of commerce, second, among the so-called resinoids, only to resin of podophyllum (podophyllin). Dried alcoholic extract of leptandra differs to such an extent from the precipitated resin, which was named "leptandrin" by its discoverer, Mr. W. S. Merrell,

as to forbid their substitution for each other. If the resin be rubbed with distilled water, and the mixture be then poured upon a filter-paper, the filtrate will be colorless, almost tasteless, and free from bitterness. Under the same conditions the filtrate from the dried extract is dark colored and very bitter.

Resin of leptandra will never run together at ordinary temperatures nor in any atmosphere. On the contrary, extract of leptandra upon exposure to a moist atmosphere, or if not well dried, will run into a hard lump. The yield of dry extract, made by the process I suggest, will average 10 per cent. of the weight of the root employed.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER, PH.D.

Inorganic Chemistry.—*On the Atomic Weight and General Characters of the New Elements Ytterbium and Scandium.*—Nilson, the discoverer of the latter of these two claimants for recognition as elements, has worked up some $9\frac{1}{4}$ kilograms of the rare mineral euxenite, and has extracted therefrom the mixed oxides of the rare earths. He considers that there are seven of these earths, viz.: Scandia, ytterbia, thulia, erbia, terbia, a new earth provisionally designated by Soret as X (holmia), and yttria. Prof. Cleve, the discoverer of thulium and, independently with Soret, of holmium, extracted these mixed earths at the same time from 15 kilos of gadolinite, so that the two investigators had 6 to 7 kilos of the rare earths to divide between them, which was done by Prof Nilson undertaking the study of ytterbium, scandium and holmium, while Prof. Cleve retained the earths erbia and thulia. After a long and tedious purification of the ytterbia he was enabled to get it perfectly free from other earths and determined the atomic weight of the element. The mean of seven determinations was 173.01. Ytterbia, Yb_2O_3 , is a white, very heavy and infusible powder, which is slowly attacked by acids in the cold or at a gentle heat; at a boiling temperature, however, is readily dissolved by dilute acids. Its solutions are colorless and show no absorption spectrum. Its sp. gr. is 9.175. Its solutions have a very sweet and yet astringent taste. It gives no flame coloration, but the spark spectrum of its chloride contains a large number of characteristic lines.

Four determinations of the atomic weight of scandium were made, the mean of which was 44.03. Scandia, Sc_2O_3 , is a white, loose

powder, infusible and possessing much similarity to glucina or magnesia. The earth has a sp. gr. of 3.864. It does not impart any color to the flame, although the spark spectrum of its chloride is particularly fine, containing more than 100 bright lines. A number of its salts have been prepared and are described by Nilson.—*Berichte der Chem. Ges.*, xiii, pp. 1430 and 1439.

On the New Elements Thulium and Holmium.—Cleve has studied the thulia, extracted from the mixture of rare earths, sufficiently to be able to describe it more fully. Both the oxide and its salts are uncolored, like those of ytterbium, but its solutions show in the spectroscope two absorption rays, which do not appear in the spectrum of pure erbia. The atomic weight of thulium is approximately 170.7 if we accept for the oxide the formula Tm_2O_3 . Soret has studied and figures the spectra of the several rare earths of the yttria group. Besides erbium he identifies the earth first noted by himself, under the designation X, and afterwards independently discovered by Cleve, and named by him holmium, which name Soret now accepts, an earth designated as $Y\beta$ by Marignac, and independently discovered by Lecoq de Boisbaudran and named by him samarium; and lastly didymium.—*Comptes Rendus*, No. 91, pp. 328 and 378.

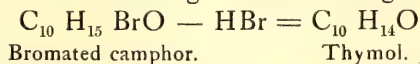
Organic Chemistry.—*Crystallized Oxalic Acid.*—A. Villiers describes the preparation of crystallized anhydrous oxalic acid. It may be obtained by dissolving 1 part of the ordinary acid in about 12 parts of warm concentrated sulphuric acid, and allowing the solution to stand for several days. The anhydrous acid is deposited in remarkably transparent, voluminous crystals of the form of the octahedra, with a rhombic base, generally modified by the face p of the primary prism, with a cleavage parallel to this face. When exposed to the air the crystals take up two molecules of water and fall to powder.—*Four. Chem. Soc.*, August, p. 544.

Behavior of Starch with Glycerin.—Sulkowsky records the observation that starch is dissolved with ease by hot glycerin, and hereby becomes changed into the soluble condition. If some 60 grams pulverized starch are stirred in 1 kilogram concentrated glycerin and the whole heated in a porcelain dish, with continued stirring, there occurs at first a strong swelling up of the starch granules. After some steam has escaped and the mass is heated to $130^\circ C.$, the consistency increases so considerably that the stirring requires considerable exertion. The starch granules have changed into an amorphous mass, and a trans-

parent paste results. When the temperature is raised to 170°C . the mass becomes quite fluid again and the starch is entirely dissolved. At a temperature of 190°C ., when the glycerin begins to escape in thick fumes, the starch is almost completely changed into the soluble modification. If this glycerin solution, when cold, be poured into water, what unchanged starch remains separates as paste and can be filtered off from the solution of the other modification. From this filtrate strong alcohol will precipitate the soluble starch. The author finds that while potato-starch is changed quite easily into the soluble modification; wheat-starch requires an hour's heating to 180 to 190°C ., and rice-starch even at the end of that time is only incompletely changed.—*Ber. der Chem. Ges*, xiii, p. 1395.

Action of Zinc Chloride upon Monobromated Camphor.—Schiff finds that if a mixture of zinc chloride and bromated camphor be heated to about 150 to 160°C . in an oil-bath streams of hydrogen bromide escape, and if after the reaction is ended the mixture be distilled over the naked flame a fluid is obtained, which consists chiefly of two substances—a hydrocarbon and a phenol. These can be easily separated by shaking with potash solution. The hydrocarbon boils at 137.6°C ., and analysis shows it to be a hexahydro-xyllol, C_8H_{16} .

The phenol possesses the formula $\text{C}_{10}\text{H}_{14}\text{O}$ and is a colorless viscid fluid. It boils at 231 to 233°C ., and appears to be a liquid thymol and indeed the same as that obtained by Kekulé by the action of iodine upon camphor. It is formed according to the following reaction:



—*Ibid.*, p. 1407.

Investigation of Picrotoxin (from Menispermum cocculus).—Barth and Kretschy have separated by fractional crystallization from benzol and afterwards from water three constituents of picrotoxin, viz.: Picrotoxin, picrotin and anamirtin, and in the relative proportions of $32 : 66 : 2$. Picrotoxin has a fusing-point 201°C ., reduces silver nitrate, especially on addition of ammonia and Fehling's solution, when heated. It is exceptionally bitter and very poisonous. The result of numerous analyses gives as its formula $\text{C}_{15}\text{H}_{16}\text{O} + \text{H}_2\text{O}$. Picrotin is more difficultly soluble in benzol, fuses at 250 to 251°C .; shows nearly the same properties, but is not poisonous. Its composition is $\text{C}_{25}\text{H}_{30}\text{O}_{12}$, with varying amount of water of crystallization. Anamirtin is found in the mother-liquors of the pure picrotoxin when crystallized out of water. It

has a neutral reaction, does not reduce ammoniacal silver solution, nor Fehling's copper solution, has almost no bitter taste and is not poisonous. The analyses correspond nearly to the formula $C_{19}H_{24}O_{10}$.—*Ibid.*, p. 1243.

Resin from Rosewood.—Terreil and Wolff have studied the resin from rosewood. It has a brilliant black color with a brown reflection, a vitreous fracture and a balsamic odor; its sp. gr. at $15^{\circ}C$. is 1.2662, and it melts at $95^{\circ}C$. It dissolves in all proportions in alcohol, but is less soluble in ether, chloroform and carbon disulphide and is insoluble in water.

Soda and potash dissolve the resin, forming brown-colored solutions, from which it is again separated in brown flakes on adding an acid; on boiling the solution an odor resembling benzaldehyde and hawthorn is evolved. Sulphuric acid also dissolves the resin with a blood-red color; by adding water the resin is precipitated without alteration. When treated with nitric acid it yields an acid of an orange color, crystallizing in needles. On distillation white vapors are evolved at first, having an odor resembling those from gum-benzoin, but containing no benzoic acid, then an essential oil passes over and finally tarry matters. Its analysis corresponds with the formula $C_{21}H_{21}O_6$; it forms salts with lead and barium. By extracting other colored woods, such as amaranth wood, iron wood, ebony, etc., with alcohol, resins resembling that from rosewood are obtained, but not in so large a proportion; rosewood yields 35 per cent. of its weight of resin.—*Four. Chem. Soc.*, August, p. 559.

Technical Chemistry.—*False Vermilion.*—A German paper cautions the public against a false vermilion placed extensively on the market, which may be detected as follows: The false vermilion has too bright and brilliant a color, and consists chiefly of red lead with a very small percentage of eosine. This last color may be extracted by means of strong alcohol and the red lead remains.—*Four. of App. Science*, August 2, p. 123.

A New Substitute for Ivory, etc.—A new substitute for ivory, coral, leather, caoutchouc, etc., lately patented in England under the name of vegetaline, is prepared as follows: Cellulose (woody fibre) from any source whatever is treated with sulphuric acid of $58^{\circ}B$. (=sp. gr. 1.676), at $15^{\circ}C$. (= $59^{\circ}F$.), then washed with water to remove excess of acid, dried and converted into a fine powder. This is mixed with resin soap in a mortar, and the soda of the soap is removed by treatment with sulphate

of aluminum. The mass is now collected, dried again and pressed into cakes by hydraulic pressure. These cakes are then cut into thin plates, which are shaped by again subjecting them to pressure. By adding castor-oil or glycerin to the mass before pressure the product may be made transparent. Colors may be imparted by the use of vegetable coloring agents. Facts respecting the strength and elasticity of this product are wanting.—*Ibid.*, August 2, p. 123.

PILL-COATING AT THE DISPENSING COUNTER.

BY W. B. THOMPSON.

If the pharmacist would be rescued from the thralldom imposed by the manufacturer, and rise again from the grade of a peddler to the dignity of a factor and compounder, he must, by his own ingenuity, devise the means to remove his present abasement. In order to regain his prestige, instead of being the mere vendor of the products of others, he must originate and present his own. The manufacturer has ruthlessly invaded the domain of the pharmacist, and despoiled him of much that should characterize the importance and dignity of his calling. The pharmacist should invoke to his aid his natural allies, the physician and the public, and all who are conscientiously interested in the freshness, purity and integrity of medicine, to enable him to banish from his shelves and repositories the degenerate coated pill, with all its numerous congeners in diversified shapes, which have insidiously effected an entrance into the realm of modern pharmacy. So long as fashion demands a coating upon pills let it be of the least objectionable character, and let such coating be applied extemporaneously, and let the material to be thus enveloped be likewise prepared extemporaneously—at the time it is needed for use—*never* before—and let the virtue of medicine in pill-form be characterized by its utility, and not, as is now too often the case, be exposed to the risk of failure and worthlessness in order to serve the pecuniary interests of those manufacturers who have, by means of a credulous medical profession and a confiding public, succeeded in successfully reaching the pockets of the people through those avenues of trade which legitimately belong to the dispenser.

The extemporaneous coating of pills at the dispensing counter must come quickly into vogue if the dispenser be intelligently alive to the demands of the medical profession, to the needs of his patrons and to his own interests; and he who is ready with a practicable process and suit-

able mechanism for the accomplishment of this will be a benefactor to the suffering sick, and to his fellow-craftsmen as well.

From the openly-expressed opinions of a large number of members of the medical profession, as well as his own somewhat extended observation and experience, your correspondent believes that the prepared pills of the day, after extended opportunity, have failed to secure, to any considerable extent, the confidence of physicians, of the public and of pharmacists, and that now is an opportune time to return to original principles in prescribing and compounding, and to resist further innovations.

The sole and single object of this paper is to suggest to pharmacists everywhere the importance of this subject, and to point to that direction in which ingenuity and thought may be wisely, as well as profitably, exercised.

A careful scrutiny of that pharmaceutical literature, which is accessible to us all, on the subject of a material for the coating of pills, seems to concentrate upon some of the forms of gelatin as being best adapted to the purpose. In a recent number of the "*Journal of Pharmacy*" an ingenious formula was offered by a contributor for the coating of pills. This, in the hands of the writer (after gaining some experience in the dexterity of manipulation), appeared to very nearly answer the desired purpose. The desideratum to be sought is a coating, at all times ready, possessing such quick solubility, tenacity and rapidly-drying property as shall at once adapt it to a want which is manifestly needed, and which once attained will quickly revolutionize at least one branch of the dispensing business.

Philadelphia, Sept. 25th, 1880.

COATING PILLS,

From two communications contained in the *Australian supplement to the Chemist and Druggist*, April, 1880, p. 97, we extract the following directions :

I. I may say that I have tried chalk, gum, starch, isinglass, sugar, French chalk, gelatin, mucilage, glue, simple syrup, albumen and arrowroot. In some instances I have used the above separately, and in others combined them, but obtain the best result as follows : Dissolve one drachm isinglass in one and a-half ounce simple syrup ; pour a small quantity whilst warm upon some pills that have been made, say,

a few weeks, and become hard. After shaking them about for a short time sprinkle over some French chalk; place them in a flat-bottom tin and apply a gentle heat; keep them continually rotating, adding more chalk, if necessary, until dry. I find that the coating neither cracks, nor does it peel off. I had no guide in my first attempt to sugar-coat pills, and if any correspondent is in possession of a better method, maybe he will kindly enlighten his brethern.

II. Make a solution of tolu in ether, nearly saturated (the refuse from making syrup of tolu answers equally well, and is more economical); put the pills into a jar and moisten thoroughly with the solution; then throw them into French chalk contained in the pill-coater, and after rotating in the usual manner expose for a short time to allow the coating to dry; then coat twice in succession as follows: Mix equal parts of fresh mucilage of acacia and water, add two drops of this to each dozen pills, and throw them into French chalk as before; finally remove all the chalk from the coater and polish the pills by rotating them for some time in the coater.

The object in first coating with the solution of tolu is to prevent the discoloration of the coating, which invariably follows if this is omitted.

During an experience of thirteen years I have never found the least objection to the use of tolu.

French chalk, or lycopodium, will be found the best for dusting the pills when rolling, as liquorice and such-like powders adhere to the pills, increasing their size and otherwise interfering with coating them satisfactorily.

USE AND ANALYSIS OF THE COCKROACH.

BY STANISLAS MARTIN.

Translated from Bulletin Général de Thérapeutique, 1880, Août 30, p. 168.

The cockroach has become a popular remedy in Russia. Dr. Bogomolow regards it useful, when reduced to powder, in the dose of 3 decigrams in dropsy of the heart, of the liver and of the kidneys; it is also prescribed in Bright's disease. Dr. Unterberger had on several occasions treated scarlatinous dropsy, and one case of morbilious dropsy, which were cured by giving 18 to 30 centigrams of cockroach three times daily. Dr. Kœhler states that he obtained the same results from the use of this remedy.

It seemed to me interesting to search for the principle to which we

must attribute the action of the cockroach. The cockroach (*Blatta orientalis*) is an insect which is found in all parts of Europe ; in France it infests the baking-room of the bread bakers, the hot-room of the confectioners, the kitchen of the restaurants. The food it likes best is flour. To procure cockroaches I have employed the following trap :

Pour some beer in a bowl ; to facilitate the ascension place from the floor to the top of the bowl a small board or a piece of linen ; arrived at the top the insect falls into the dish and is drowned. If cockroaches are caught by the hand put them into a bottle containing a few drops of sulphuric ether.

The dried and powdered cockroaches were treated with cold water, with water rendered alkaline by carbonate of sodium, with sulphuric ether and sulphide of carbon. The infusion with cold water was evaporated to dryness. The residue was not large ; it was divided into two parts ; one of it thrown on burning coals did not produce deflagration. The other part was put into sulphuric acid without producing any vapor which had any effect on guaiac paper. The soap obtained with alkaline water was decomposed by sulphuric acid, then treated with appropriate reagents showed the absence of alkaloids.

To which ingredient, to which cause, should we attribute the medicinal action of the cockroaches ? I do not know it. Let us hope that another experimenter will be more successful than I have been. With sulphuric ether and sulphide of carbon a fatty body of a fetid odor is obtained. To get rid of these importunate and disgusting guests I have advised the use of phosphorus paste, which is thinned by water and spread with a brush ; also used for filling the cracks in the floors and walls of the place occupied by them.

H. C. C. M.

REPORT ON THE ACONITE ALKALOIDS.

By C. R. ALDER WRIGHT, D.S.C. (Lond.), Lecturer on Chemistry in St. Mary's Hospital Medical School, and E. H. RENNIE, M.A. (Sydney), D.S.C. (Lond.), Demonstrator of Chemistry in St. Mary's Hospital Medical School.

The alkaloids contained in 300 lbs. of fresh aconite herb (*A. napellus*), grown at Foxton, in Cambridgeshire, were isolated by the methods described in last year's report, viz., crushing, maceration in alcohol, expression of extract, evaporation to a smaller bulk, and treatment of the liquid (weighing about 59 lbs.) with soda and repeatedly shaking with ether. A quantity of alkaloidal matter was thus readily dissolved

out, a small portion remaining permanently dissolved in the alkaline fluid, in a form difficultly soluble in ether; the alkaloidal matter thus retained yielded nothing crystalline on precipitation with mercurio-iodide of potassium and treatment with sulphuretted hydrogen, and appeared to be all but destitute of the characteristic physiological action of aconite, producing little or no tingling of the lips when applied thereto; it greatly resembled the corresponding substance similarly obtained from the extract derived from the various kinds of aconite roots examined in previous reports, consisting of a mixture of amorphous bases of lower molecular weight than aconitine, some of which differ therefrom markedly in being readily soluble in caustic and carbonated alkalies, and in being only imperfectly removed from such solutions by ether.

The alkaloidal substances dissolved out by the ether treatment, being mixed with a large quantity of greenish soft resin, were separated therefrom by agitation with tartaric acid solution and separation of the tartrate solution thus formed; on treating this with sodium carbonate and ether about 15 grams of alkaloids were finally obtained by the spontaneous evaporation of the ethereal solution. No artifice employed was successful in making this product either crystallize or yield crystallized salts of any kind; it appeared, however, to contain a notable amount of aconitine, producing an energetic action on the lips when cautiously applied thereto, though it was by no means so powerfully active as pure aconitine. On combustion it yielded the following numbers, indicating, as did also its physical properties, that it was substantially the same mixture of alkaloids as that occurring in *A. napellus* roots, only differing therefrom in containing a smaller percentage of aconitine, the quantity of uncrystallizable bases being relatively much larger.¹

(1.) .2845 gram of substance, dried at 110°, gave .6735 CO₂ and .217 H₂O.

.459 gram of substance, burnt with soda lime, gave .01222 N.

A portion of the substance was dissolved in dilute hydrochloric acid, and the solution precipitated by slow addition to a dilute solution of

¹It would seem to be highly probable that the presence in excess of non-crystalline bases, preventing crystallization of what aconitine is present, is the main cause of the difficulty which we understand is sometimes experienced in isolating the crystallizable alkaloid from *A. napellus* roots in the process of manufacture on the large scale.

sodium carbonate; the flakes thrown down after collection and washing, gave these numbers:

(2.) .290 gram gave .694 CO₂ and .195 H₂O.

.387 gram gave .00993 N.

	(1.)	(2.)
Carbon,	64.56	65.26
Hydrogen,	8.47	7.47
Nitrogen,	2.66	2.57

The sodium carbonate solution contained about a gram of a soft alkaloid, readily soluble in alkalies, and, for the most part, soluble in water, and but sparingly soluble in ether, doubtless therefore consisting largely of aconine, either produced by the saponification of aconitine during the process of working out the bases present in the herb, or else originally present therein.

The above numbers and general results are practically identical with those obtained from the mixture of aconitine and uncrystallizable alkaloids accumulating in the mother liquors from which the aconitine from *A. napellus* root (described in report 1877, p. 461) had separated by crystallization, two samples of them giving the following numbers:

Carbon,	65.80	65.46
Hydrogen,	7.78	7.58
Nitrogen,	2.71	3.05
Benzoic acid formed by saponification,	14.4	14.1

On boiling up the mixture of alkaloids (1) above benzoic acid was formed to a somewhat greater extent than with these two samples; 2.227 grams gave of purified acid, by titration .3904 grams, by direct weighing (including a minute amount of resinous matter), .397 gram.

By titration, 17.5

By weighing, 17.8

The benzoic acid produced melted at 120°. It gave no trace of coloration with ferric chloride after fusion with caustic potash at 250°, acidulation and treatment with ether; whence, evidently, no veratric (dimethylprotocatechuic) acid was present, and therefore no pseud-aconitine was contained in the herb employed.

Hence, it results that the quantity of active alkaloid contained in the aconite herb is probably somewhat less than that contained in the roots, reckoned on the dry substance: for a quantity of roots was found (Report, 1876, p. 539) to contain about .07 per cent. of total bases, of which aconitine constituted so large a proportion that about two-fifths of the total alkaloid was obtained as pure crystallized aconitine. Admit-

ting the 300 lbs. (or about 135 kilos) of fresh herb to represent one-fifth of that amount of substance in the same state of dryness as the roots (an estimate probably in excess of the truth), the total yield of alkaloids readily soluble in ether being about 15 grams, this would represent about .05 per cent. of total alkaloids contained in the dry herb; the percentage of aconitine in this amount of total alkaloids being much less than that in the root alkaloids, so that the relatively large amount of non-crystalline bases wholly prevented crystallization.

It can, however, hardly be concluded from these two cases that it is a general rule that aconite roots are richer in crystallizable aconitine than the dry herb, for we are informed by Mr. John Williams that it has sometimes happened in his factory that no crystallizable aconitine at all, but only non-crystalline bases could be isolated from batches of roots worked up on the manufacturing scale in precisely the same way as other batches which readily yielded crystals; whence it would seem that the roots occasionally are either poorer in aconitine or richer in non-crystalline bases than those described in the Report for 1876; and it is therefore much to be desired that further experiments should be made as to the quantity of crystallized aconitine that can practically be isolated on the manufacturing scale from roots of various ages, and grown in different soils and climates, etc. Such experiments as these, like the analogous questions as to what precise method of manipulating and what menstrua will best suffice on the large scale to separate aconitine economically from the non-crystalline alkaloids accompanying it, cannot readily be carried out by the scientific chemist working in his laboratory on a comparatively small scale; but they are indispensable in order to put the economical production of crystallized aconitine on a sound commercial footing.

At the present moment the pharmaceutical aspect of the production of aconitine is as follows: Prior to the last eight or ten years the term "aconitine" was applied to an amorphous alkaloidal substance extracted by processes investigated by Von Planta, Geiger and Hesse, and other chemists, from *A. napellus*, and probably mixtures of that and other species. During the last decade the experiments of T. B. Groves and Duquesnel, together with those carried out by the aid of the Pharmaceutical Conference grants by Alder Wright and collaborators, and described in the series of reports of which this is the concluding one, have demonstrated that the active alkaloid of *A. napellus* (to which for some years the name "aconitine" has been restricted) is

a definite crystallizable substance occurring naturally intermixed with larger or smaller quantities of amorphous bases of much less highly active characters, and is readily split up by various chemical reagents into benzoic acid and a base (aconine) comparatively speaking inert. The want of uniformity in physiological action of the product obtained by processes such as those employed by the older chemists being due partly to the presence of variable quantities of the natural amorphous alkaloids co-existing with aconitine, and partly to the decomposition of a large portion of the aconitine originally present by the action of the particular chemicals and mode of treatment employed during the extraction operations. Further, the relationships of this aconitine to other analogous aconite alkaloids derived from other species (*e. g.*, pseudaconitine from *A. ferox*), and to organic bodies generally, have been attentively studied.

As a consequence of these experiments, a demand for pure crystallized aconitine has sprung up, more especially in America, the object being to replace the amorphous unreliable preparations generally met with in the market by the pure uniform alkaloid; but at the present moment this demand is, to a great extent, unsatisfied, because whilst the supply of *A. napellus* of American growth is too limited to enable American drug manufacturers to prepare the pure alkaloid themselves, its manufacture in Europe has not yet been carried out to any considerable extent; from whence it results that, whilst the Committee of the American Pharmaceutical Association on the Revision of the U. S. Pharmacopœia is desirous that the forthcoming new edition of that pharmacopœia should exclude the amorphous preparations, and should define aconitine solely as the crystallized uniform body $C_{33}H_{43}NO_{12}$, described in detail in former reports to the Pharmaceutical Conference;¹ yet it appears at present somewhat doubtful whether it will be practicable for this desire to be carried out, simply because this pure article is not to be found in the market, at any rate, to an extent at all comparable with the demand for it.—*Phar. Jour. and Trans.*, Sept. 11, 1880.

¹ For an epitome of the characters (physical and chemical) of aconitine and other allied aconite alkaloids, *vide* "The Pharmaceutical Journal," July 3, 1880, and following numbers, in which some points connected with the practical economical side of the question are discussed, the origin of these communications being an application to the subscriber by Dr. Charles Rice, chairman of the Revision Committee of the U. S. Pharmacopœia, for a *précis* of the characters of aconitine and other information concerning it for the guidance of the committee.—C. R. ALDER WRIGHT.

ASHY INGREDIENTS IN Light Colored COD LIVER OIL.

BY PROFESSOR E. A. VAN DER BURG.

In the first part of the "*Scheikundige Onderzuckingen*," by G. J. Mulder, Dr. L. J. de Jongh says, on page 479 of his "*Chemical Investigation of the Composition of Cod Liver Oil*": "No less differ the series of inorganic ingredients which we have discovered in codliver oil from those mentioned by others." Further on, on page 480, line 10: "The reason why Marder, who, to our knowledge, has been up to the present time the only one that makes special mention of the inorganic ingredients of the cod liver oil, has found no phosphoric acid, is that he has not tried to find it. In declaring this, viz., the reasons why the results of our investigations on this point differ from those of others, we believe we have done no more than our duty. If we now look on the different results of our own investigations of the three sorts of cod liver oil we may state that the light-colored oils contain more inorganic ingredients than the dark-colored."

Dr. Jongh also tells us that his investigations led him to the discovery that in the former the quantity of phosphoric acid is nearly double and that of lime more than double what is found in the latter.

Considering that hardly any incombustible matter is found in the light-colored oil, it may be of importance to know how Dr. de Jongh got those figures.

To determine the phosphoric acid and the sulphuric acid a certain quantity of the oil was saponified by the admixture of potassa caustica. The soap which was obtained in this way was decomposed with hydrochloric acid. After the removal of the fatty acids the phosphoric acid in the filtered liquor was determined as phosphas ferricus and the sulphuric acid as sulphas barycus.

In order to see how much calcium, magnesia and soda the mixture contained a certain quantity of it was carbonized, the carbon digested with hydrochloric acid, and the phosphoric acid removed from the acid liquor as phosphas ferri. After filtration the calcium was determined as oxalas calcis, and after this had been removed the magnesia was precipitated as phosphas ammonico-magneticus. The filtrate was now mixed with sulphuric acid, evaporated in a platinum cup, incinerated and weighed, and as no potash was found the weight was taken account of as sulphas sodæ.

In this manner the author found in light-colored cod liver oil the following percentages:

0.09135 Phosphoric acid
 0.07100 Sulphuric acid
 0.15150 Lime
 0.00880 Magnesia
 0.05540 Soda

Total 0.37805 per cent. inorganic matter or
 0.32265 per cent. incombustible ingredients, if the soda,
 which may be volatilized as chloric sodium, is not counted.

What was, however, the result of a direct experiment, the burning in a platinum cup? Nothing more or less than this—a quantity of no less than 35 grams of light-colored cod liver oil left no weighable quantity of ash.

These experiments have often been made with the light-colored Lofodin cod liver oil of Draisma Van Valkenburg, and generally crowned with the same success.

Likewise other sorts of cod liver oil produced the same results. For instance, 23.867 grams of an English oil that was very pure, left 0.0005 gram of a light brown ash, in which iron, but hardly any calcium, could be distinguished; accordingly 0.002 per cent.

22.408 grams of Dr. de Jongh's oil, which is darker than the two sorts mentioned above, left 0.002 gram of ash, in which iron and calcium were distinguishable; accordingly 0.009 per cent.

Hence it may be safely stated that light-colored cod liver oil contains hardly any or no incombustible matter.

How, then, are the results of Dr. de Jongh's experiments to be accounted for? Inasmuch as this phosphoric acid, calcium, etc., have really been found in an analysis, they can only have originated from the vessels or the reagents that were used, a warning example, no doubt, that one cannot be too scrupulously accurate in ascertaining the rectitude of the results that one has acquired through analysis.—*Pharm. Jour. and Trans.*, Sept. 4, 1880.

ANALYSIS OF IODINE-IRON CODLIVER OIL.¹

BY PROFESSOR E. A. VAN DER BURG.

From the above it is evident that the light-colored cod liver oil after combustion leaves no weighable quantity of ash. The quantity of iron may be found by burning at least 20 grams in a small porcelain or platinum cup, and weighing the iron oxide that is in that way produced.

¹ The method of making this preparation is described below.

This weight multiplied by 0.7 gives the quantity of iron in the oil. If the oil is of the right kind there should be 0.27 per cent. of iron. One has to be very careful in burning the oil, as it is very combustible, and the experiment consequently liable to fail.

The vessel—I always use one of platinum—should be filled for no more than one-sixth. It should be heated by a gas flame under the chimney. The oil will be observed to lose the violet color and become brownish-red. As soon as the color of the oil has changed in this way, there will be a sufficient quantity of combustible vapor, that may be ignited by a flame, and will keep burning for some time. At that moment the gas flame should be removed, and the combustion, that heretofore took place in a very great flame, will keep on quietly. As soon as the flame is extinguished, the vessel should be heated anew, and again some inflammable vapors will appear. When the oil is completely carbonized, a beginning should be made with a total combustion of the carbon. This last process may be quickened a good deal, if every now and then a drop of water is poured on the cooled carbon, and after a slow and careful evaporation of the water the carbon is ignited afresh. The red ash may be determined as pure iron oxide. Should further proof be wanted, the ash may be dissolved in hydrochloric acid, reduced by zinc, after which the iron may be easily determined by the ordinary titrated solution of potassium permanganate.

To find out the iodine, 5 grams of the oil is sufficient. This should be saponified with an alcoholic solution of potash (which must contain no iodine, of course), by heating it for an hour or two, in a porcelain cup on a water-bath. After this the soap must be completely carbonized in the same cup by careful heating, and the carbon treated with water, until it ceases to have an alkaline reaction. As a test that the combustion has taken place in the right manner, the solution must be totally colorless. The clear liquid must be rendered a little acid by admixture of hydrochloric acid and precipitated by a solution of palladium. The precipitate may be weighed now, or as palladium metal, after heating. If the preparation has been of the right composition, 5 grams will produce about 0.087 gram of iodetum palladiosum, or about 0.025 of palladium.—*Ibid.*

PREPARATION OF IODINE-IRON CODLIVER OIL.

BY S. DRAISMA VON VALAENBURG.

Being invited by the Rotterdam Department of the Dutch Pharmaceutical Society to make the manner in which I prepare my iodine-iron codliver oil public, a thing which I had often thought of, but different circumstances had up till now prevented me from carrying out, I herewith present to the public the following prescription:

R	Iodii,	.	.	.	.	.	part	1'25
	Ferri pulverati,	.	.	.	.	.	"	2'50
	Ol. jecor. asselli,	.	.	.	.	.	"	98'50

The iodine is thrown into a vessel filled with codliver oil, and by constant stirring or shaking for some days made entirely to dissolve into it, so that the liquid when left for some time to itself has a specific weight of 0'932 to 0'937 at 13'5 to 21°C.

The solution is now poured in a vessel which is hermetically shut, and brought into contact with iron by shaking or stirring it with this ingredient for some four hours until it gets a purple-violet color, and after a due shaking with solution of iodetum kalicum and diluted starch has lost the power to produce a reaction on free iodine.

The liquid must now stand quietly for twenty-four hours (the vessel must be carefully shut, and nearly full), then shaken again for an hour at least till it has been proved, after again shaking with a little iodetum kalicum amyllum solution (also after twenty-four hours) that the preparation is wholly exempt from free iodium, may easily be made an emulsion, and consequently remain constant. The mixture must now stand till it appears clear, and one must make sure by specific weight and analysis that the desired combination has taken place.

The oil should be conserved in well-corked bottles, filled to the top and of yellow-colored glass, which must have as little surface exposed to the air as is possible.

The bottles are supposed to be emptied in five days; scrupulous investigations have brought to light that in this space the air can produce but a very trifling change in the oil.

The mixture must be of a purple-violet color, and should have a specific weight of 0'937 to 0'940 at 8 to 13°. It should contain 1'23 per cent. of iodine and about 0'27 per cent. of iron, both in a chemically combined condition. The mixture will become of a darker color and the quantity of iron greater, as the air has had more time to form iron oxyiodide. Nothing of an iodine reaction must be observed

when the mixture is shaken with diluted starch, not even if to the latter should be added a solution of kalium iodide. The addition of kalium iodide, which seizes the free iodine that might be in the oil, greatly enhances the sensibility of the amyllum reaction.

I prepare my codliver oil in quantities of 800 to 1,000 liters in a vessel that is provided with a stirring apparatus, and several cocks placed in gradual elevations. The vessel must be of iron, and capable of being shut hermetically. During the preparation, samples of the oil, of the iodine solution and of the iodine-iron solution are sent to Prof. Vanderburg, and not before he has tested them is the operation proceeded with.

In large quantities French iodine is, in my opinion, to be preferred above English iodine. The latter is finer and consequently mixed itself easily with the oil to a tough mass, which cannot be resolved again but with great difficulty. In small quantities the solution of the iodine may be considerably quickened by pulverizing the iodine in a mortar. A long shaking with iron ought not to be omitted in this case. Though apparently all the iodine is dissolved to a clear liquid, close investigations have shown that, especially with large quantities, small parts of a dark colored matter will adhere to the bottom of the vessel, from which no shaking or stirring can remove them. This matter is insoluble in ether. It may be nearly completely burnt. The eye, with the aid of a microscope, can detect no crystallization. This circumstance probably explains why the iodine-iron codliver oil is of a finer taste and odor than the original oil.

That the mixture, after its purity has been tested, shows a free iodine reaction when it has stood for 24 hours, finds its explanation in the fact that a small quantity of ferrid-iodide seems to have been produced, which soon decomposes itself into ferro-iodide and iodine. The violet color owes its origin to the small particles of ferrid-oxyiodide, which can hardly be avoided but by a very careful removal of the air during the shaking with iron.

A preparation that should be *totally* free of ferrid-oxyiodide is not the thing that is desired. Then, being a little darker colored than the oil which was used, it obtains immediately after it has been brought into contact with the air the peculiar dark violet color, and may be used as a sensible characteristic reagent for oxygen. Without taking this precaution, the quantity of the oxyiodide combination will amount

to very little (though sufficient for the color) if the preparation has been gone through with due care. Analysis will sufficiently show this.

The oxydizable properties of the mixture will become evident if a drop is exposed to the air on the lid of a cup. At once the color will change, while at last the liquid will have a color little darker than the original oil. If the drop is made to spread by strongly blowing upon it, the above reaction will appear much more quickly, on account of the higher temperature as well as the vapor of water of the breath.

It is very remarkable that water will spoil the mixture. We once had to ascribe the loss of about 10 tuns to this cause. This influence of water may be easily shown. If 1 drop of water is shaken up with about 10 grams of the oil in a well-corked bottle, great changes will soon be observed in the color. The water seems to rob the oil of the ferro-iodide for some part, and for the other to decompose it by mutual influence.

It is still noteworthy that the quantity of iron was larger than was absolutely necessary, because this quickens the combination. Exact investigations, made expressly for this purpose, have clearly shown that the codliver oil which is prepared with the due observances remains constant.—*Pharm. Journ. and Trans.*, Sept. 11, 1880

AROMATIC PRODUCTS OF THE ANIMAL BODY.

BY E. BAUMANN.

Hydroparacoumaric acid being the first, and under the conditions given by the author, the final putrefaction product of tyrosin, putrefaction affords a convenient method of preparing it. 20 grams of tyrosin thus yield 12 grams of hydroparacoumaric acid. Salkowski has shown that when it occurs amongst the decomposition-products of albumin, it is also derived from previously-formed tyrosin.

The homologous parahydroxyphenylacetic acid is also generated during the digestion of albumin, and may be detected in the urine by evaporating 5 to 10 cc. with hydrochloric acid to remove phenols, and extracting with ether. With Milton's reagent the ethereal extract gives the red color characteristic of hydroxy acids. The acid may be prepared by evaporating 25 liters of urine to 1½ liters, strongly acidifying with acetic acid and shaking with ether, a little alcohol being added to decompose the emulsion which frequently forms. The extract, freed from acetic acid, is again dissolved in water and exhausted with

ether. The portion of this second extract, soluble in water, gives with basic lead acetate a precipitate of lead parahydroxyphenylacetate, from which the acid may be liberated by sulphuretted hydrogen, and purified by crystallization from water and benzin (m. p. 148°). About $\frac{1}{2}$ gram of crude acid is thus obtained. Hydroparacoumaric acid (m. p. 126 to 127°) is occasionally obtained from the urine by the same process; it separates more slowly and incompletely from hot benzin than its homologue.

Parahydroxyphenylacetic acid might be supposed to owe its origin to an amido acid, $C_8H_9NO_3$, homologous with tyrosin, especially since Schützenberger has detected numerous amido acids of the fatty series amongst the decomposition-products of albumin; the author shows, however, that tyrosin alone is produced when horn-clippings are boiled with dilute sulphuric acid.

In order, if possible, to detect some of the transition-products between hydroparacoumaric acid and phenol, 5 grams of the former were administered to a man in whose urine hydroxy acids and phenols were normally present only in minute quantities. On subsequently examining the urine it was found that the greater part of the acid had been destroyed; a small part ($\cdot 8$ gram) was obtained unchanged; and a still smaller quantity had been converted into a phenol, obtained as an ethereal sulphate. Parahydroxyphenylacetic acid could not be detected.

That portion of the ethereal extract from urine, obtained as above described, which was sparingly soluble in water, contained oily acids which reacted with nitric acid like indole, and on prolonged contact with putrescent substance yielded a considerable amount of skatole, but no indole. These nitrogenous acids dissolve in hydrochloric acid, and are resinified when boiled with it. They are probably the sources of skatole and indole in the urine and in decomposed albumin; since after either has been boiled with hydrochloric acid and the precipitated resins removed, the basis are no longer obtained by putrefaction: and putrescent albumin, not so far decomposed as to contain indole after being agitated with ether, does not yield indole on further putrefaction, whilst the ethereal extract, when neutralized with sodium carbonate and diluted with water, yields that base on standing in the incubator for six days.—*Jour. Chem. Soc.*, Sept., 1880, p. 648.

MINUTES OF THE COLLEGE.

PHILADELPHIA, September 27th, 1880.

The semi-annual meeting of the Philadelphia College of Pharmacy was held this day, at the College Hall. Dillwyn Parrish, President, in the chair. Twenty-four members in attendance.

The minutes of the last stated meeting were read, and, on motion, adopted.

The minutes of the Board of Trustees for July, August and September were read by Mr. C. Bakes, Secretary of the Board, and, on motion, approved.

Alonzo Robbins, Chairman of the Delegation to the American Pharmaceutical Association, read the following report, which, meeting with approval, was referred for publication:

To the Philadelphia College of Pharmacy:

The delegates elected to attend the meeting of the American Pharmaceutical Association, at Saratoga Springs, N. Y., respectfully report that the meeting was held at the time and place appointed, and was an occasion of much interest, from the great number in attendance, the large addition to the list of members, and the variety of interesting papers presented.

The sessions were held in Congress Hall concert-room, and an eloquent address of welcome was delivered by Mr. Charles F. Fish, of Saratoga.

The social entertainment consisted of a reception in the parlors of Congress Hall Hotel, a carriage ride to the various medicinal springs and other points of interest, a grand hop in the ball-room and a banquet at the hotel; all of which passed off in a pleasant manner.

The exhibition was held in the roller skating rink, and was very large and complete, over fifty different individuals and firms contributing to it; most of the remedies lately introduced into medicine, and many drugs in the original packages were shown; the exhibition is a valuable and attractive adjunct to the meetings, and well deserves the continued recognition of the Association.

A very important change was made in the method of transacting the business of the Association; an Executive Council was elected to take the place of the present Executive and Business Committees; this change is expected to greatly facilitate the business at future meetings.

The balance required to complete the Centennial fund was collected during the sessions.

This College was honored by our fellow-member, Mr. James T. Shinn, being elected President of the Association for the ensuing year.

One hundred and sixty-eight new members were elected; this is probably the greatest increase of membership ever obtained at one meeting, and is largely due to the Committee on Membership appointed at the meeting in Indianapolis.

The Association adjourned on Friday morning, Sept. 17th, to meet at Kansas City, Mo., on the fourth Tuesday of August, 1881.

On Friday afternoon a party of over eighty made an excursion to Au Sable Chasm, arriving there the same evening; after spending, on Saturday, an hour or two in examining this remarkable natural wonder, about half of the party returned, the others remaining until Monday. The return was by railway, along the bank of Lake Champlain to Baldwin, then down Lake George by steamboat to Caldwell, and then by stage to Glenn's Falls, where the railway was resumed, to Albany, at which place the party separated. This excursion will be long remembered with delight by all who were so fortunate as to participate in it.

Respectfully submitted.

ALONZO ROBBINS,
CHARLES W. HANCOCK,
ROGER KEYS, M. D.,
CHARLES A. HEINITSH,
Delegates in attendance.

September 27th, 1880.

Prof. Maisch, on behalf of the Delegates to the Convention of Teaching Pharmaceutical Colleges read a report, which was also referred to the Secretary for publication :

To the Philadelphia College of Pharmacy :

The undersigned, in behalf of the delegation to the Conference of Schools of Pharmacy, respectfully reports as follows :

Two of the three delegates were present at Saratoga. A meeting had also been called by the Committee of Revision of the U. S. Pharmacopœia, of which your two delegates are likewise members ; and, deeming the latter at present of greater importance, they were not present at the first session, and the undersigned was the only representative of this College at the second session of the Conference.

At the first session an organization for the current year was effected by re electing Dr. Chas. A. Tufts, of Dover, N. H., Chairman, and Prof. J. M. Maisch, of Philadelphia, Secretary. At the second session the recognition by the various Pharmaceutical Examining Boards of the diplomas of the Colleges was discussed. It had been suggested that the Boards should examine all applicants for registration, including Graduates in Pharmacy ; but all members present were averse to this suggestion, and regarded a College diploma, based upon a term of apprenticeship and an examination before the College, as better evidence of qualification, and entitled to recognition throughout the United States.

The value of a written thesis, as a requirement for graduation, created an animated discussion, several delegates being in favor of discontinuance, because, it was asserted, many theses were merely copied from published works ; the time devoted for writing the thesis could be better spent in studying ; and most of the theses presented to the Colleges were without any real value. On the other hand, it was suggested that the quality of the theses could be improved by requiring them to be on subjects of original investigation ; by conferring a special title as an equivalent for a meritorious original thesis ; and by stimulating original investigations by the offering of prizes and otherwise. It was further insisted by your delegate that, even if original dissertations were not required, the writing of an essay on a well known subject should be regarded as a means of study and acquiring knowledge from the investigations of others and from the critical examination and sifting of facts.

A resolution was finally passed, making the subject for discussion at the next Conference the advisability of discontinuing the writing of a thesis as one of the requirements of graduation.

JOHN M. MAISCH.

A letter from M. Kratz, of Germantown, to the Secretary, was read, conveying the information of the death of John Butler, a member of the College, which took place in February, three years ago.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

First Session, Tuesday Afternoon, Sept. 14th. — The twenty-eighth meeting of the American Pharmaceutical Association convened in the spacious concert room of Congress Hall, at Saratoga, N. Y., and was called to order at 4 o'clock P.M. by President Sloan, who introduced the Local Secretary, Mr. C. F. Fish, by whom an address of welcome was delivered. A Committee on Credentials, consisting of Messrs. Whiting, of Massachusetts ; Gordon, of Ohio, and Luhn, of South Carolina, was appointed, and the President then proceeded to deliver his annual address, in which, after referring to some business transacted during the past year, and to others claiming attention at the present meeting, he discussed the changes in vegetation produced by various influences, and dwelt more particularly upon the dis-

appearance of medicinal plants in consequence of the destruction of our forests, which demand attention in this aspect as well as in other important particulars; an excellent suggestion of the very instructive address was the recommendation to State Pharmaceutical Associations to confer with State Boards of Agriculture in regard to the more systematic cultivation of medicinal and other useful plants. The address was well received, and was referred to a committee consisting of Messrs. Scheffer, of Kentucky; Ingalls, of Georgia, and Robbins, of Pennsylvania, to report upon such suggestions as may require action on the part of the Association.

Invitations were received and accepted to attend the dramatic readings of Miss A. Detehm, and to visit the Saratoga County Cabinet, containing collections of geology, mineralogy, palæontology, archæology, etc., of the county. Invitations to attend the sessions were extended to the medical and pharmaceutical professions of Saratoga, and to the members of the Committee of Revision of the U. S. Pharmacopœia present.

The Executive Committee reported 141 applications for membership. On roll call, 137 members were found to be present at the opening session.

The Committee on Credentials reported having received and examined credentials from 36 societies, namely from the Colleges of Pharmacy at New York, Washington (National), Chicago, Boston, St. Louis, Cincinnati, Philadelphia, Pittsburg, Montreal, Ontario, Louisville and Baltimore; from Alumni Associations of the Cincinnati, Massachusetts, New York, St. Louis, Louisville and Philadelphia Colleges of Pharmacy; from Pharmaceutical Associations of the States of Wisconsin, New Hampshire, North Carolina, Connecticut, South Carolina, Vermont, Iowa, New Jersey, Pennsylvania, New York, Kansas, Ohio, Georgia and Kentucky, and the Province of Quebec; and from the King's County, N. Y., and Newark, N. J., Pharmaceutical Associations, and from the Society of German Apothecaries of New York.

The Committee reports were handed in, and laid upon the table, when the Nominating Committee was appointed, consisting of one member of each of the thirty-six delegations, and of the following gentlemen from the Association at large: J. G. Thibodeaux, of Louisiana; W. B. Blanding, of Rhode Island; W. J. Morley, of Texas; E. Martin, of Indiana, and E. Bocking, of West Virginia. A Committee on Exhibition was appointed, consisting of Messrs. E. H. Dalrymple, of New Jersey; C. Huston, of Ohio; Wm. Blaikie, of New York; P. C. Candidus, of Alabama, and Geo. H. Schater, of Iowa.

Professor Remington read the report of the Committee on By-laws, contemplating the organization of a Business Council, the consideration of which was made the special business of the second session after the transaction of the regular business. An adjournment was then had until 9 o'clock the next morning.

Second Session, Wednesday Morning, Sept. 15th.—After the reading and approval of the minutes of the first session, the following officers and committees were placed in nomination: *President*, Jas. T. Shinn, Philadelphia. *Vice-Presidents*—Geo. H. Schafer, Fort Madison, Ia.; Wm. S. Thompson, Washington, D.C.; Wm. Simpson, Raleigh, N. C. *Treasurer*, Chas. A. Tutts, Dover, N. H. *Permanent Secretary*, J. M. Maisch, Philadelphia. *Reporter on Progress of Pharmacy*, C. L. Diehl, Louisville, Ky. *Executive Committee*—G. W. Kennedy, Pottsville, Pa.

Chairman; A. W. Miller, Philadelphia; Chas. Huston, Columbus, O.; Thos. Doliber, Boston, and the Secretary *ex-officio*. *Committee on the Drug Market*—Louis Lehn, New York, *Chairman*; Jas. G. Steele, San Francisco; I. L. Lyons, New Orleans; Thos. Whitfield, Chicago; J. P. Muth, Baltimore. *Committee on Papers and Queries*—J. U. Lloyd, Cincinnati, *Chairman*; S. H. Ambler, New York; W. W. Bartlett, Boston. *Business Committee*—H. J. Menninger, Brooklyn, N.Y., *Chairman*; Chas. L. Eberle, Philadelphia; E. H. Heinitsh, Columbia, S. C. *Committee on Prize Essays*—C. L. Diehl, Louisville, *Chairman*; J. F. Judge, Cincinnati; E. Scheffer, Louisville. *Committee on Legislation*—J. M. Maisch, Philadelphia; J. W. Rankin, Atlanta, Ga.; S. A. D. Sheppard, Boston.

The nominees were balloted for and elected. Credentials were received from the Nova Scotia Pharmaceutical Society and the accredited delegate was, on motion, admitted. Messrs. Saunders, of Canada, and Ebert, of Illinois, conducted the president and vice-presidents elect to their chairs, and short addresses of thanks were made by the new officers. A ballot was had for the candidates for membership reported at the first session and they were unanimously elected. On motion of Mr. Kennedy a committee consisting of Messrs. Eberle, Diehl and Ebert was appointed for the purpose of raising at this meeting sufficient funds so that the Association may come into possession of the Centennial Fund.

The report of the Executive Committee was read, and permission was granted to add obituary notices of several deceased members. The report was accompanied by that of the Permanent Secretary, which gives an account of the expenses of his office and of the property in his charge.

The Treasurer reported a balance on hand amounting to \$1,561.61, which includes \$370.00 received for life-memberships; \$49.32 interest from the Ebert Fund and \$1,585.00 yearly contributions for the current year. The report and books of the Treasurer were placed into the hands of an auditing committee consisting of Messrs. Gordon of Ohio, Dalrymple of New Jersey, and Sloan of Indiana.

The introductory part of the annual report on the Progress of Pharmacy was read, and the whole report referred for publication. The report on the Drug Market by M. L. Lehn, gives valuable and interesting information on many drugs and chemicals, but mainly such which have been recently introduced or revived as remedial agents. The Committee on Prize Essays reported that no award had been made for 1878 and 1879. A verbal report was received from the Committee on Legislation, and ordered to be completed and printed.

The report of the Committee on Membership stated that more than two-thirds of the applications acted on this morning were replies to the efforts of the committee. Sixteen additional candidates were proposed for membership.

The committee charged with the publication of last year's report on the revision of the Pharmacopœia reported that that duty had been attended to, and that from the funds collected for the purpose, a surplus of \$78.79 had been paid over into the Centennial Fund. The committee appointed early in the same session reported that it had succeeded in collecting the entire balance required for that fund.

The special business of the morning session was then taken up and the report on the organization of a business council was considered in detail and adopted as proposed. The council consists of the eight officers of the Association, *ex-officio*, and of nine members, three of whom are elected for one year, three for two years and three for three years, and hereafter three councilors are elected annually for the term of three years. The Council elects its own chairman and secretary and three committees on membership, finance and publication. The Executive and Business

Committees are discontinued and their duties transferred to the council. Applications for membership are made to and examined by the council and reported to the Association, and if no objection is made, the applicants are elected by the council. All actions of the council are subject to revision by the Association.

The Nominating Committee was directed to present nominations for nine members of the council, and the Executive and Business Committees were requested to continue in office until the close of the present meeting. The Association then proceeded in a body to the exhibition room for the examination of the exhibits and then adjourned until the following morning at 9 o'clock.

Third Session, Thursday Morning Sept. 16th.—The minutes of the second session were read and approved. A telegram conveying greetings from the California College of Pharmacy was read and received with applause. Invitations were extended to the Association from the following places: Cincinnati, Chicago, Kansas City, Mo.; Asbury Park, N. J.; Washington, D. C.; Peoria, Ill.; and Milwaukee, Wis. The invitations were referred for consideration and report to a committee consisting of Messrs. Markoe of Massachusetts, Lilly of Indiana, and Luhn of South Carolina.

Dr. Squibb proposed an amendment to the by-laws, referring to the appointment of the Nominating Committee, in such a manner that the delegations coming from one State appoint one member only (instead of one member for each delegation). Dr. Roberts moved a substitute, favoring the nomination of the officers by the council, with the exception of President and Vice Presidents, who were to be nominated and voted for at the second session of each annual meeting. The propositions were laid over for consideration to the next session.

Prof. Oldberg read a paper on *the nomenclature of the Pharmacopœia*, which was accepted with thanks and referred for publication. The paper is not adapted for a brief resumé, the most important part being the arguments advanced in favor of the proposed changes.

Mr. Fish read an able paper, illustrated by sketches and tables, on *the mineral waters of Saratoga*, which was accepted with thanks and referred for publication.

The Committee on the Next Annual Meeting reported in favor of Washington, D. C. A telegram just received from the Kansas Pharmaceutical Association urged Kansas City for holding the next meeting. Further consideration was deferred until the afternoon session.

Prof. Diehl read his *third report on fluid extracts*, giving the results and comparisons of numerous experiments, and accompanied by many specimens. The aim of the report was to throw light upon the relation of strength of fluid extracts made so that a definite weight of drug should be made into fluid extract of the *same weight* or of the *measure holding an equal weight of water*.

Prof. Markoe read a paper on *the preparation of ferric hydrate*, showing that when made from strong ammonia and iron solutions, there is no difficulty in washing out the ammonia salts from the precipitate, if care is taken to break up the lumps of the latter previous to the addition of the wash water.

Mr. Kennedy read a paper on *Pharmaceutical Preparations of the Bark of Rhus Purshiana*, proposing a *fluid extract* with a mixture of 13 volumes of alcohol to 7 volumes of water; also an *elixir*, made with a similar menstruum, containing in the pint 3 ounces of the bark, the same weight of glycerin, and flavored with oil of orange gtt. vi, and oil of cinnamon gtt. ii.

A paper by Mr. Candidus on *the increase of bulk by dissolving solids in liquids*, reports the increase to be, for

20 grams	Acid, citric,	. '12	cc.	10 grams	Potass. citras,	. '033	cc.
5	Acid, oxalic,	. '03		3	Potass. permangan.,	. '01	
10	Ammon. nitras,	. '06		3	Quinid. sulphas,	. '024	
5	Barii chlorid.,	. '012		10	Sodii bromidum,	. '031	
10	Calcii chlorid.,	. '043		10	Sodii hyposulphis,	. '05	
10	Ferri et potass. tart.,	. '04		5	Sodii sulphocarbolas,	. '023	
10	Ferri pyrophosph.,	. '05		10	Zinci sulphas,	. '04	

Mr. Kennedy read a paper on the *rhizome of Aspidium marginale*, stating that it

can be readily obtained, and agreeing with the view previously expressed, that its substitution for Filix mas should be recognized by the Pharmacopœia.

Mr. S. L. Coffin's paper on *the exhaustion of lupulin by aromatic spirit of ammonia* reports that the menstruum proposed does not appear to be superior to alcohol, either in the quality or therapeutic properties of the preparation.

In a communication by Mr. C. M. Miller on *Cologne water*, the adoption by the Pharmacopœia of a formula for such a preparation was urged, but no formula was proposed.

The final report of the Committee on the Centennial Fund was read by the Chairman and accepted, when the Association adjourned.

Fourth Session. Thursday Afternoon, Sept. 16th—Vice-President Schafer presided. The minutes of the preceding session were read and approved. The amendments to the by-laws relating to the formation of the Nominating Committee were discussed at length, and after repeated votings and balloting on motions pertaining thereto, not adopted.

The sixteen applicants, announced before, were duly elected.

The Auditing Committee reported the accounts of the Treasurer and of the Committee on the Publication of the Pharmacopœia report to be correct.

The report of the Committee on the President's Address, read at the third session, was considered, and the Executive Committee (Council) empowered to employ a suitable person for preparing an Index of the Proceedings for the last decade. Resolutions favoring the repeal of the stamp tax on medicines, perfumery, etc., were, after considerable discussion, laid on the table.

A paper by Prof. Lloyd on *Leptandrin* (see page 489) was read; it was accompanied by numerous handsome specimens of the product described.

Dr. Power read a paper on *the volatile oil of Asarum Canadense*, giving its chemical composition, etc. We hope to find room in our next number for publishing this essay. A vote of thanks was tendered to the author.

The Executive Committee reported the names of eight applicants for membership, who were subsequently elected.

The report of the committee on the next annual meeting was called up, and after a lengthy discussion it was finally decided to meet next year in Kansas City, Mo., on the third Tuesday of August. The date was subsequently reconsidered and the *Fourth Tuesday of August* adopted as the time of the next meeting.

Fifth Session, Friday Morning, Sept. 17th.—After the reading and approval of the minutes of the preceding session, Mr. A. G. Vogeler read a paper on *syrup of liquorice root*, advocating its preparation by exhausting eight troyounces of the cut root by a mixture of one ounce ammonia water and 48 ounces water, agitating the percolate with four drachms of magnesium carbonate, filtering, evaporating to 16 fluidounces, straining, and dissolving in the liquid 48 troyounces of sugar.¹

The resolution favoring the repeal of the stamp tax was taken from the table and then passed after inserting the words "except proprietary medicines."

Mr. R. W. Gardner read a lengthy paper on *Elixirs and their preparation*, and exhibited a number of samples. The paper contains a large number of formulas for preparations which, in our opinion, are far better prescribed by physicians, as needed, perhaps with the aid of one or two pleasant vehicles that might be made official, but under a more appropriate name than "elixir."

Mr. Louis Dohme contributed a lengthy paper entitled *observations on some of the iron preparations*, in which modifications for certain processes are proposed, with the view of attaining greater accuracy in the results.

A paper by Mr. Chas. Caspari, Jr., on *Pyrophosphate of Iron* was read, recommending the substitution of sodium citrate for ammonium citrate as yielding a stable and uniformly soluble compound. Seven fluidounces of solution of tersulphate of iron are precipitated by 2,242 grains of crystallized pyrophosphate of iron at a temperature of 50°F., the washed precipitate is dissolved with the aid of 2 troyounces of citric acid and the solution neutralized by the addition of 720 grains, or a

¹There is evidently a clerical error in the figures.—EDITOR A. J. PH.

sufficient quantity, of dry carbonate of sodium, then evaporated and scaled in the usual manner.

Mr. A. G. Vogeler contributed a paper on *fruit syrups*, giving the results of his experience with various methods of their preparation.

The following nominations were reported by the Nominating Committee: Local Secretary, Wm. T. Ford, Kansas City; Business Council, *for three years*, H. J. Menninger, Brooklyn, N. Y.; Jos. P. Remington, Philadelphia; Geo. W. Kennedy, Pottsville, Pa. *For two years*, Thos. Whitfield, Chicago; Wm. Saunders, London, Ont; S. A. D. Sheppard, Boston. *For one year*, W. J. M. Gordon, Cincinnati; John Ingalls, Macon, Ga.; Jos. Roberts, Baltimore. The nominees were duly elected.

On motion the Committee on New Membership appointed last year was continued and increased by the appointment of seven additional members.

Resolutions of thanks were passed to the Committee on Membership, the Local Secretary and Local Committee, and the names of five candidates for membership reported, who were afterwards elected.

The Association then adjourned until 11.15 A. M.

Sixth Session, Friday Morning, Sept. 17th.—The minutes of the fifth session having been read, resolutions of thanks were passed to the proprietors of the Saratoga Mineral Springs and of Congress Hall; also to the retiring officers.

The Committee on Exhibition was granted permission to finish their report for publication within thirty days. The Committee on Queries reported a number of subjects accepted for investigation by members. Unanswered queries, the continuance of which is not requested, were ordered to be dropped.

The Association finally adjourned to meet in Kansas City, Mo., Aug. 23d, 1881.

Entertainments and Excursions.—On the evening of Sept. 14th, an informal reception of the members and their ladies took place in the parlors of Congress Hall. On the following afternoon a large number of vehicles conveyed the party to the various mineral springs of Saratoga, extending over an area several miles in length, and after a drive through Woodland Park the party returned to the hotel to make preparations for the grand hop which took place in the evening in the large concert room. On Thursday many ladies and some of the members made an excursion to Saratoga Lake and enjoyed a sail on this handsome sheet of water. On Friday afternoon, after the final adjournment, a party of about 80 members and ladies proceeded by rail in two palace cars to Port Kent, where stages were in waiting to convey them to the Lakeview House, about three miles distant; and the same evening, in bright moonlight, a visit was paid to the Falls in the neighborhood. On the following morning the weather was cloudy and for awhile a drizzling rain fell, which, however, did not deter the tourists from visiting Au Sable Chasm and taking a boat ride on the river to the head of the lower rapids. During the forenoon about one-half of the party returned with the view of spending Sunday on Lake George or on Manhattan Beach. The party remaining at the Lakeview House over Sunday took a drive by stages to Auger and Butternut Ponds, where a splendid view of a portion of the Adirondack mountains was obtained; they revisited the ever interesting chasm, spent some time at Alice Falls and the rapids of Au Sable river, and on Monday returned via Lakes Champlain and George to Caldwell, where some remained over night, the others passing on by stage to Glenn's Falls, to obtain a view of the Falls of the Hudson, such as could be had with the low state of water in the river. All that were present at the meeting will doubtless long remember it as one replete with interest and genuine pleasure.

MEETING OF THE BRITISH PHARMACEUTICAL CONFERENCE.

The British Pharmaceutical Conference has marked the seventeenth year of its existence by extending its travels to the Welsh principality, the only portion of the British Islands previously unvisited by it in the course of its annual meetings. And

although doubtless the attendance was unfavorably influenced by the difficulties which lie in the way of reaching Swansea from many parts of the kingdom, as well as the fact that neither the town itself nor its hotels present attractions which would tempt a tired pharmacist to spend a portion of his hard earned holiday in breathing a smoke-laden atmosphere, there was, nevertheless, sufficient in the hearty welcome given by the local committee and in the interest of the business done to repay well those who did make the venture.

At the commencement of the proceedings, August 24th, a tolerably long list of delegates from various societies was read over, but unfortunately very many of those named were conspicuous only by their absence. The Pharmaceutical Society of Great Britain was represented by the President, Vice President and three other members of Council, but neither the Secretary, the Assistant Secretary, nor—with the exception of Professor Attfield—the Professors of the School of Pharmacy put in an appearance. The Pharmaceutical Society of Ireland was wholly unrepresented. American pharmacy, however, was for a time represented by Professor Maisch; but having, as Secretary of the American Pharmaceutical Association, to be present at the coming meeting at Saratoga, he was compelled to take his leave before the termination of the Conference.

The report on the state of the finances shows a balance of over five hundred pounds, a kind of white elephant apparently, since only one application has been made during the year for a money grant in aid of research. Whether or not it be by reason of the opening up of other and more fertile hunting-grounds for the seekers of grants in aid that the funds at the disposal of the Conference are thus disregarded we cannot say, but it is evident that some five hundred pounds is now going a begging, and that there is an opportunity for some one to devise a means by which it may be applied to a purpose useful to pharmacy.

The death of Mr. Stoddart was naturally referred to in feeling terms in the report, not only by reason of his helpful connection with the Conference from its inception, but also because he had so highly distinguished himself in various ways as to make his loss a special matter of regret, requiring expression in the manner unanimously agreed to by the meeting in accordance with the proposal of Mr. Reynolds and Mr. Brady.

The retirement of Professor Attfield from the position he had filled so long and so ably was another regretful feature, which contributed to make the report of the Executive Committee more than ordinarily gloomy.

The Presidential Address is this year a deviation from the course usually followed on such occasions; and though it cannot be said that the address presents any very obvious utilitarian features, it affords material for thought, and at a time when pharmaceutical affairs are in such a high state of tension, when the future of a large section of the trade is, to say the least, so unpromising, it was probably expedient to abstain as far as possible from the discussion of trade interests and from stirring the troubled waters of pharmaceutical politics.

The first paper read formed the conclusion of the series of reports on the investigation of the *aconite alkaloids*, carried out by Dr. C. R. Alder Wright with the aid of grants from the Conference. In this instance the material operated upon was the fresh herbaceous portion of *Aconitum napellus*, grown at Foxton, in Cambridgeshire, the method of operating being the same as that described in last year's report. The alkaloid obtained by evaporation from the ethereal solution could not be made to crystallize or yield crystalline salts, though from its activity it appeared to contain a notable amount of the alkaloid which Dr. Wright regards as true aconitine. Judging from analysis, its composition was inferred to be substantially the same as that of the mixed alkaloids obtained from the roots of *A. napellus*. The uncrystallizable character of this mixture of alkaloids was ascribed to the larger amount of amorphous bases preventing crystallization. The experiments made by Dr. Wright appeared to show that, though the dry herb did not contain very much less total alkaloid than the equally dry root, the percentage of aconitine in the alkaloid obtained from the herb was much less than in that obtained from the root. This result, however, cannot be regarded as representing the invariable proportion of the

alkaloids, since it is inconsistent with the observation of Mr. Williams, that sometimes no crystallizable alkaloid is to be obtained in operating upon the roots. This apparent variability would appear to show that it is desirable to make further experiments with a view of ascertaining how far the amount of crystallizable aconitine may be influenced by differences in the age of the roots or by differences in the soil and climate in which they are grown. Dr. Wright considers that experiments of this kind, as well as those necessary for ascertaining the precise method of treatment and the menstrua best suited for separating crystallizable aconitine economically on the large scale from the non-crystallizable alkaloids associated with it, cannot be readily carried out by the scientific chemist in his laboratory. It appears, therefore, that this investigation still leaves unsatisfied the want which, on a previous occasion, we pointed out as being the most pressing, namely, a means by which the peculiar substance possessing powerful physiological activity can be practically separated from the less active substances associated with it. Until this is done there is no prospect of being able to satisfy the demand that exists for a more definite form of aconitine for medical purposes.

In Professor Flückiger's paper on the *Essential oil of Buchu Leaves*, he pointed out that the oil contains a crystalline substance analogous to carbolic acid, to which he gives the name "dios-phenol." The liquid portion of the oil, chiefly distilling between 205° and 210°C. , possesses an odor very like that of peppermint. This oil is destitute of rotatory power, and has a composition approximately represented by the formula $\text{C}_{10}\text{H}_{18}\text{O}$. It also appears, from some experiments made by Dr. Power, that this compound is contained in the oil in the form of a compound ether. Professor Flückiger did not find that the specimen he operated upon contained salicylic acid. In connection with this paper, it may be mentioned that in 1865 Mr. Umney pointed out, in a paper read before the Students' Association at Bloomsbury Square, the existence in the oil of *Barosma betulina* of a crystalline substance, of which he obtained 500 grains from 20 fluidounces of the oil. It is to this substance that the greenish coloration of the oil with ferric chloride is to be ascribed.

Dr. Power then read a paper by Professor Flückiger and himself on the *Constituents of Peppermint Oil*. In operating upon Mitcham oil, obtained from Schimmel & Co., of Leipzig, which had been deprived, by repeated rectification, as completely as possible of menthol, about 10 per cent. of an oil was separated, which had not before been investigated. The greater portion of it distilled between 165° and 175°C. , and had a composition intermediate between the formulæ $\text{C}_{10}\text{H}_{16}$ and $\text{C}_{10}\text{H}_{18}$. When purified by distillation over metallic sodium it was divided into two fractions of specific gravity, .859 and .856. By the distillation the peppermint odor was lost, and gave place to that of freshly distilled oil of turpentine. A small portion of the oil, of a somewhat viscid character, was distilled over at a higher temperature, and is considered to be represented by a multiple of the simple formula $\text{C}_{10}\text{H}_{16}$, probably $\text{C}_{15}\text{H}_{24}$. According to these results the liquid portion of Mitcham peppermint oil would appear to consist of isomeric and polymeric terpenes. The authors were unable to isolate the substance which forms a crystalline compound with alkaline bisulphides when some samples of peppermint oil are operated upon in this way. It is considered as probably having a boiling point approximating to that of menthol, and to be the cause of the remarkable color reaction and fluorescence displayed by fresh oil of peppermint when left in contact with a few drops of nitric acid (1:20), since this reaction is not given by the terpenes nor by menthol. In the discussion that followed, attention was directed to the necessity of ensuring in investigations of this kind that the material operated upon is free from any kind of adulteration, and in illustration of the fact that it was not always sufficient to purchase what is represented to be the best commercial article, Mr. Reynolds referred to the gloves mentioned by Mr. Southey, whose worst gloves were distinctly known as "best," and who had four other kinds, which he called "better than best," "better than better," "best of all," and "real best." Mr. Umney also pointed out that from the crude manner in which the distillation of oil of peppermint is carried out, it was to be expected that even genuine samples would contain more or less empyreumatic materials, unless they were again carefully rectified by distillation with water.

In the paper upon *the Discoloration of Syrup of Iodide of Iron* Mr. T. B. Groves dealt with the inconvenience arising from this liability to alteration, which so frequently gives rise to doubts whether medicine containing this preparation has been correctly dispensed. Mr. Groves illustrated this by stating that he had been found fault with for supplying a colorless and flavorless article to a customer who had previously been furnished with a discolored syrup, though for no better reason probably than George the First's cooks were complained of for not supplying the royal table with oysters so high in flavor as those to which His Majesty had been accustomed in Hanover. As a means of remedying this inconvenience, Mr. Groves suggested that a minute trace of phosphoric acid should be added in making the syrup, in order to insure the action formerly pointed out by him in the "Pharmaceutical Journal" (vol. ix, 2d series, p. 421); and though, as he remarked, this plan would be considered hateful and unorthodox by some, many will be glad to learn how of two evils to choose the lesser. In the discussion that followed the reading of this paper, attention was chiefly directed by a remark from the President to the importance of the character of the sugar used for making syrups. It was shown that the greater part of the sugar met with in English commerce is beet-root sugar, which will not do for the manufacture of syrup of iodide of iron. In reference to the difference between the sugar from beet-root and that from the cane, Mr. Andrews stated that he knew it as a fact that they differed in solubility, and that he had commenced a series of experiments upon the subject. The contamination of beet sugar with ultramarine was also referred to by Dr. Symes, who was of opinion that by proper treatment it could be rendered as fit for use as cane-sugar. Upon Professor Attfield's suggestion, it was understood that Mr. Andrews undertook to follow up the subject experimentally, and therefore we may now look forward to having this difficulty removed.

At the conclusion of the discussion following Mr. Groves' paper the Conference was adjourned until 2.30, and in the interval the members partook of lunch in the garden adjoining the institution.

The next paper read, on resuming the business proceedings, was contributed by Dr. De Vrij, whose valuable services in connection with the introduction of the cinchona tree into India and the manufacture of "Indian quinine" have recently been recognized in the conferring upon him the dignity and distinction of a Companion of the Star of India. It described a method for the *detection of amorphous alkaloid in citrate of iron and quinia*, based upon the solubility of the oxalate of that base in water and the consequent yellow coloration to be observed when an adulterated sample is operated upon as described in detail in the paper. A somewhat discursive discussion followed the reading of this paper, in the course of which it was pointed out by Mr. Umney and others that the amorphous alkaloid sometimes found in citrate of iron and quinia may be due to the alteration of quinia during the manufacture of the preparation. By some it was also considered that this result arose from the defective nature of the Pharmacopœia process. Mr. Fletcher recommended the plan of tasting the preparation as being, in his opinion, a convenient method of detecting the presence of amorphous alkaloid by its peculiarly unpleasant bitterness.

In Dr. Symes' paper on *New and Unofficial Preparations* attention was drawn to the practical inconvenience arising from the want of any authoritative formulæ for the novel preparations which are now so frequently employed by medical men. By reference to the various strengths of tincture of gelsemium and hydrobromic acid he illustrated the embarrassment that may be caused in dispensing, and he suggested that the formulæ for such preparations should be regulated by the decision of some such authority as the Medical Council. Although the removal of uncertainty by the adoption of such a plan would be very desirable, it cannot be overlooked that there are considerable difficulties to be encountered. As stated by Mr. Greenish, many of these preparations are too insignificant and too ephemeral in their application to merit any such official cognizance, and if the merits of new articles of materia medica and new preparations are to be decided by experience, it is precisely during the intervening period that the difficulties referred to by Dr. Symes would

remain unprovided for. Possibly some conjoint action of members of the medical profession and representatives of the Pharmaceutical Society might be devised that would ensure that prescribers ordering new preparations would have their wishes carried out, and that at the same time dispensers should be at no loss to ascertain what those wishes were. At any rate the question is one that deserves attentive consideration on both sides.

In a paper on the *Cultivation of Calisaya* Mr. J. E. Howard described comparatively the conditions under which this tree is grown for the production of cinchona bark in Java, Ceylon, the continent of India and South America, and brought forward statements of various authorities to show the extent to which the supply of rich quinia-yielding bark might be expected to increase. As introductory to this, Mr. Howard described the examination of a small tree of *Calisaya Anglica*, which had been killed by canker in his conservatory, after attaining in eight years a height of seven or eight feet. He considers the source of mischief to have been situated in the root, but was not able to learn anything very definite respecting it. In Java where the *Ledgeriana* grows so well and yields such rich bark there is no canker; but it appears that there are few parts of Ceylon where this tree can be grown so as to yield bark so rich in alkaloids, while on the Neilgherries the bark is of excellent quality and commands a high price, although the trees grow bushy and spindly. In Bolivia, again, where calisaya has been cultivated in its native locality, at the suggestion of Mr. Ledger, within the last thirty years excellent results have been obtained. Mr. Howard, however, thinks that none of this bark, as imported into London, had the appearance, or was so rich in alkaloid as the true *Ledgeriana*, possibly in consequence of the seed not having been selected with such skill as that collected by Mr. Ledger's servant Manuel. For this reason, therefore, the cultivation of calisaya in Bolivia cannot be expected to yield such remarkable results as it has done in Java especially. The same circumstance also points to the importance of selecting superior sorts in establishing or extending plantations in India. Effectual drainage and high cultivation are also essential conditions to be provided for. In Ceylon as in Java it has been found that the *Ledgeriana* surpasses all other kinds in yielding bark containing a large amount of quinia. On the whole, therefore, Mr. Howard thinks that true calisaya, as introduced by Mr. Ledger, will continue to assert its supremacy there as elsewhere. But he also points out that, according to Mr. McIvor, Ceylon is wanting in the deep rich soils to be found in India, and that since, according to the same authority, cinchonas are very liable to canker when the roots get down to the subsoil, there is for this reason less promise of future results in Ceylon than there is on the Neilgherries.

It is indeed to this cause that Mr. Howard ascribes the death of the calisaya tree grown in his greenhouse, and perhaps it is not going too far to infer that Mr. Howard's mention of the death of that tree, and his conjecture as to the cause of it, may be intended to operate in some degree as a check upon the enthusiastic expectations entertained as to the future results of the cultivation of calisaya in Ceylon. In reference to these prospects M. Howard quotes the calculations of Mr. Dobree, published in the "Ceylon Observer" of last June, which point to an annual production of about ten million pounds of bark in about 5 years' time, and predict that the total production of cinchona bark will in 1885 exceed the total demand in 1876-78 by nearly eleven million pounds. Mr. Howard thinks these calculations far too sanguine even as regards quantity, and in any case, he thinks that one feature more likely to become manifest in 1885 is that the representatives of quinia manufacturers attending the sale rooms at that time will distinguish with the pencil-note "rubbish" many of the consignments of Ceylon bark.

Closely connected with the subject of the foregoing paper was the exhibition, by Dr. Paul, of a peculiar kind of cinchona bark, with the object of showing that it is now no longer possible to arrive even at an approximate conclusion as to the value of a sample of bark from a mere visual examination. Leaving out of account the fact that the officinalis, or crown bark now coming from India, contains a large amount of quinia, while that hitherto known as "crown bark," or "Loxa bark," from South America seldom contains much, if any; it is also to be noted that

amongst the bark derived from South America it is equally impossible to judge of the value of a sample from its outward appearance alone. The old landmarks are no longer sufficient for indicating whether a bark is worth only a few pence a pound or the same number of shillings. Thus, for instance, the official "yellow bark," or "flat calisaya," of the present day is rarely what it used to be, but, on the contrary, seldom contains much or any quinia at all, and only a little cinchonia. On the contrary it often happens that bark of unusual or novel characters comes into the market containing an amount of quinia and other alkaloids that renders it intrinsically very valuable. In the case of the specimen exhibited this fact was well shown, for to all appearance it was of little or no value. It represented a somewhat considerable parcel of bark that was imported in June, 1879. It did not recommend itself for making pharmaceutical preparations, and quinia manufacturers were disinclined to buy it at any price. However, the analysis of the bark gave it a different character, showing that in addition to mere traces of quinidia, cinchonidia and cinchonia it yielded nearly $2\frac{1}{2}$ per cent. of sulphate of quinia, so that for either or both of the purposes above referred to it was an excellent bark, notwithstanding its unfavorable appearance.

The last paper, read at the second sitting of the first day's meeting, was on *Ipecacuanha wine*, by Mr. J. B. Barnes, in which he recommended, as an improvement in the preparation of ipecacuanha wine, a modification of the plan proposed by Mr. Carteighe for the preparation of an oxymel of ipecacuanha. Mr. Barnes evaporates the acetic extract of ipecacuanha to dryness, digests the residue in a proper proportion of sherry for forty-eight hours and filters. By this means he obtains a rich brown solution, which has been kept for eight months without throwing down any of the unsightly muddy sediment which is well known to be formed when the ipecacuanha wine of the Pharmacopeia is kept for a few weeks.

The meeting was then adjourned until half-past 10 on Wednesday morning, and in conformity with notice given by Mr. Grose, the local vice-president, most of the members present assembled at half-past six on their way to inspect first the Hafod copper smelting works and mills of Messrs. Vivians & Sons, who make, besides ingot and sheet copper, sulphuric acid and artificial manures, and then the Landore tin-plate works. In both these establishments every attention was shown to the visitors and every possible opportunity afforded for seeing the details of the operations.

On the reassembling of the members, on Wednesday, Mr. Brady, after apologizing for his departure from the generally observed rule of producing a written paper, proceeded to give an account of his *experiences of pharmaceutical interest during a recent journey to Ceylon and Japan*. One of the points to which his attention was directed was the cultivation of cinchona in the former island, and some of the conclusions he arrived at were very different from the statements that had been published, although it must be admitted that these were based upon later information. In reference to the cultivation of cinchona he observed that mossing is not carried out in Ceylon, for the reason that it promotes the destruction of the trees by ants, and he did not enter upon the consideration of the profitable nature of cinchona cultivation, because that had already been done in a much more commercial paper. The cultivation of vanilla was next referred to, and one case mentioned in which the rows of plants had an extent of no less than three miles. It may here be noted that the development of this business seems likely to be more rapid than profitable, for while the price of vanilla, not long ago, was 70s. per pound, it is now down as low as 10s. Assam tea and Liberian coffee were two other products mentioned as being successfully grown in Ceylon; but the cultivation of ipecacuanha was described as affording less promise. Mr. Brady then proceeded to give an interesting account of the cinnamon cultivation in the island, stating that he had been quite unable to trace the origin of the three different kinds of cinnamon bark met with in this market. In the course of his inquiries he was informed that there were not only three, but no less than fifteen varieties. The distillation of cinnamon oil was described as being carried on in a most primitive manner. One of the prominent features of Ceylon vegetation was the occurrence of cocoanut palms, which always

grow freely near human habitations, a fact that was explained to Mr. Brady as being due to the promotion of their growth by smoke; and if that alone were a sufficient explanation it might be worth while to make an experiment in the cultivation of cocoanut palms in and around Swansea. The extraction of oil from the cocoanuts was described as having been carried to a high degree of perfection; and, although some considerable degree of mystery appears to be maintained as to the way in which this done, the result would seem to be merely a natural consequence of the rational use of suitable machinery. Mr. Brady mentioned that, though cocoanut oil is habitually known to us as a solid fat, it was never met with in Ceylon in any other than the liquid form, which it was impossible to persuade the native Cinghalese was any other than its invariable condition. This striking effect of the difference in the physical character of a material produced by the influence of climate had a parallel in an experience of the speaker in Algeria as to the local idea of water, where on telling a native that in England it was possible to walk across the water in winter, his statement led to the remark, "If these Franks will tell you this no wonder they come here with the Bible." Among the points of interest that Mr. Brady came across in Japan was an ingenious form of still for making peppermint water, a figure of which will be given in a future number. In the discussion that followed Mr. White ineffectually endeavored to open up the question of the profit arising from cinchona cultivation, and Mr. Wootton as ineffectually sought to interest the meeting in the subject of the obstacles alleged to be presented by the Japanese to the importation of chemicals from this country. It was evidently felt that there were two sides to this latter subject, and that it would be wise to leave it to be dealt with by those who were more specially interested. In reference to the distillation of cinnamon oil in Ceylon, it was suggested by Mr. Umney that taking as a precedent the extraction of cocoanut oil, it would be desirable that the Ceylon growers imported a distinguished pharmacist to distil the cinnamon oil, or at any rate some one who would understand how to do it.

Mr. Greenish, in a *note on Indian Henbane*, prefaced his remarks by stating how desirable it was that the numerous vegetable products introduced from tropical and other countries should be thoroughly examined in order to ascertain whether or not they contain any active principle. Having regard to the growing scarcity of biennial henbane leaves, he had undertaken the examination of a sample of Indian henbane leaf, which had a very intense persistent odor. Having only a very small quantity he had prepared a tincture, and was inclined to think that India would possibly supply this therapeutic agent of more valuable character than that of home growth. In commenting upon this paper, Mr. Reynolds referred to the introduction of hyoscyamia by Merck, mentioning that it was usually made from the leaves, and that what was made from the root was often disappointing in its effects. Mr. Umney expressed the opinion that this product was really obtained from the leaves of the annual henbane and that the direction of the Pharmacopœia to use the biennial variety was "mere moonshine." Incidentally Dr. Symes remarked that he claimed the opinion just expressed by Mr. Greenish as a support of the suggestion he had already made that new drugs deserved careful attention. Mr. Gerrard complained that the products obtained in this way were too often only curiosities and not commercial articles.

Mr. A. H. Allen communicated some further *notes on petroleum spirit*, describing some methods which he considered calculated for distinguishing between true petroleum spirit and the analogous volatile liquid obtained from shale oil.

Mr. Greenish exhibited a sample of *cayenne pepper*, possessing all the external properties of true cayenne as grown and ground in Natal, but having an oily appearance that seemed artificial and communicating to the paper in which it was folded a greasy stain of a reddish-yellow color. It was moreover quite destitute of pungency. In this respect it seemed very much to resemble, as pointed out by Mr. Brady, the mild capsicum commonly used in Hungary as a spice under the name of "paprika."

Mr. Naylor then followed with some *notes upon the green Extracts of the Pharmacopœia*, the details of which were too copious to admit of special reference to them

here beyond stating that Mr. Naylor is in favor of the production of these extracts by evaporation in *vacuo*.

Mr. Fletcher then called attention to the *presence of arsenic in the tincture and solution of perchloride of iron*, and other articles in the preparation of which hydrochloric acid is used. He also described an indirect method for the gravimetric estimation of minute quantities of arsenicum, which consisted in treating the substance to be examined in such a way as to convert any arsenicum that it might contain into arseniетted hydrogen, passing the gas through solution of nitrate of silver and weighing the reduced silver. Mr. Fletcher gave the preference to this method over those of Levöl and Herapath, because the weight of the silver to be weighed is about nine times as great as that of the arsenic to be determined. Some doubt, however, appears to exist as to whether the whole of the arsenic in any substance to be examined would be converted into arseniетted hydrogen by the action of zinc and hydrochloric acid, although the figures given by Mr. Fletcher as representing the results obtained when operating on very small quantities appeared to show that the process is trustworthy.

In Mr. Gerrard's paper *on emulsions*, he recommends the use of powdered gum acacia as the emulsifying agent, and gave practical illustration of his mode of operation, as well as formula for the preparation of various emulsions.

A paper by Mr. Thresh *on the determination of the strength of alcoholic solutions of chloroform* was then read, as well as a report on commercial specimens of sal volatile and chloric ether, in which the results of the application of his method were detailed. After showing the wide differences between the preparations supplied and used under the names sal volatile and chloric ether, Mr. Thresh dwelt upon the desirability of observing greater uniformity; and, in the discussion that followed, the need of establishing some kind of authority that would be recognized and that would be effectual in attaining such a result was generally admitted.

Mr. Woodland's report *on the strength of commercial specimens of aqua lauro-cerasi* was essentially a reiteration of data published by Mr. Umney in this journal in the year 1869. They showed that this preparation is uncertain in every way, and is so thoroughly unsatisfactory that it is high time it was expunged from the British Pharmacopœia.

The concluding paper, also by Mr. Woodland, was a report *on the strength and purity of the alkaline solutions of potash and ammonia* met with in pharmacy.

The next business was the discussion as to the place of meeting in 1881, and as a matter of course the choice fell upon York, from which city a formal invitation had been sent by Mr. Ralph Dawson, and was personally supported by Mr. Clark. The new president proposed by the Executive Committee was Mr. Richard Reynolds, of Leeds, and the new vice presidents were Professor Attfield, Messrs. Davison, of York, and Umney, of London; as General Secretary, Mr. Michael Carteighe, of London, and as Local Secretary, Mr. Joseph Sowray, were nominated, and all were elected by a unanimous vote. Various votes of thanks were then passed. One of them, on motion of Mr. Brady, seconded by Mr. Savage, expressing appreciation of the services so kindly rendered by the Local Committee, and especially by Messrs. Grose, Hughes and Williams, in providing for the reception and accommodation of the members. Another, proposed by Mr. Chipperfield, and seconded by Mr. Hughes, who was unable to resist the temptation of addressing the meeting in the Welsh language, recognized the ability and courtesy with which Mr. William Southall had conducted the business of the meeting.

The general business of the Conference having been thus brought to a conclusion, shortly after five o'clock Mr. Schacht, at the request of the president, proceeded to the presentation of the testimonial to Prof. Attfield on retiring from the position of honorary secretary, which he had filled since the organization of the Conference. The testimonial consisted of about five hundred words of general literature.

In the course of the evening, at the invitation of the Local Committee, some of the members went for a marine excursion round the Bay.

On Thursday morning those pharmacists who bestirred themselves sufficiently

early, and could, unaided by the spectroscope, descry the sun through the sulphurous mist that invariably overhangs Landore, east of Swansea, were unanimous in deciding that although the Local Committee in its wisdom had abandoned the idea of an excursion by water, still there was every prospect that more or less of that fluid might persist in accompanying them and their friends. These forebodings, however, deterred but few, and the members, accompanied by many of the fairer sex, made a start at 11 from the Royal Institution. Coaching westward through the town, and passing the pretty villa residences that line the road they soon fancied themselves away from the devastating effects of copper smoke. Within a quarter of an hour a full view of the Mumbles was obtained, passing through Sketty Village, where abundance of honeysuckle skirted the road. A view of the bay was followed in quick succession by the pretty valley in which is the railway station of Killay. No sooner, however, was an attempt made to cross Fairwood Moor than the rain descended in such quantity as to obscure the clear-sighted vision of the guide, Mr. Grose, and to effectually prevent him from pointing out the grouse in the surrounding heather. Nothing daunted, the journey was continued; the old castles of Kilvrough and Pennard were passed, and upon reaching Penmaen the sun once more shone, and the rain disappeared for the day. From the coach road a fine view was obtained of Three Cliff Bay, Cefyn Bryn and Oxwich Burrows. Penrice Castle, the seat of Mr. Talbot, M. P., was reached about two, and the excellent enrichments of the mosaic mantlepieces and the pictures were much admired. Here the botanists enjoyed their favorite pursuit, and found during their ramble through the park to Oxwich beach *Origanum vulgare*, *Lappa minor*, *Centranthus ruber*, *Mentha rotundifolia*, *Campanula Trachelium*, *Enanthe crocata*, *Cichorium Intybus*, *Epi-lobium hirsutum*, *Menyanthes trifoliata*, etc.

Through the kindness of the Rev. Mr. Jenkins, Vicar of St. John's, luncheon was served on his lawn, and his church on the edge of the beach was visited by many. The parties here divided, the ladies coaching, others walking for a mile or two along the beautiful sandy beach, while the more robust wended their way through the wood. All, however, arrived at the Gower Union House, which had been kindly placed at the disposal of the committee by the guardians and here the whole party appreciated a very excellent "high tea" and indulged in humorous speeches, some in Welch, complimentary of Messrs. Hughes and Grose and other local friends. At dusk the excursionists retraced their way and arrived safely at Swansea soon after 10 o'clock, much pleased with their trip.—*Pharm. Journ. and Trans.*, August 28, 1880.

EDITORIAL DEPARTMENT.

To our Readers.—During the past spring and summer the Editor paid a visit to Europe, leaving the JOURNAL in charge of the Publishing Committee, and the editorial labors in the hands of his friend, Thos. S. Wiegand. The letters addressed to the Editor were in all cases promptly answered; but on his return he found quite a number which require his personal attention and will receive the same without further delay; we ask the kind indulgence of our correspondents for this unavoidable delay.

The removal from this city of our friend Mr. Louis von Cotzhausen has deprived our readers for a few months of his valuable contributions from the German journals, which for some time past appeared regularly under the title of "Gleanings." Arrangements have been made for the continuance of these abstracts and translations in the future. The material upon our table has accumulated so that it will be necessary for enlarging our next issue to 64 instead of 48 pages.

We also desire to inform our subscribers that a general index of the ten volumes, fourth series, of the JOURNAL, is in preparation and will be published with our December number, and furnished to subscribers free of charge.

Physicians and Pharmacists in Council.—In answer to a call issued by the Medico-legal Society of Philadelphia a number of physicians and pharmacists met in the hall of the Philadelphia College of Pharmacy. Mr. W. B. Thompson was called to the chair, and Dr. Stretch requested to act as Secretary.

The discussion was opened by Dr. Swayze in a lengthy discourse, in which he more particularly referred to the display of signs, the recommendation and selling of patent nostrums, to the selling of homœopathic specifics, the collusions between physicians and pharmacists, to the unauthorized renewal of prescriptions and to the unnecessary prescribing over the counter by pharmacists. The subjects were discussed separately, and in regard to patent medicines a resolution was passed requesting the Philadelphia Medico-legal Society to send a committee to all respectable pharmacists in the city for the purpose of ascertaining their willingness to place out of sight all patent medicines and to thus discourage their sale. In our opinion the request might very properly go farther and include also the discarding by pharmacists of all signs and circulars relating to and recommending patent medicines. It seems curious to us that the prescribing by physicians of specialties, many of which are protected by trade mark, and the working formulas and, in many cases, the correct composition of which are withheld by the manufacturers, was not alluded to. Can the line between these and the common nostrums be distinctly defined?

The sale of homœopathic specifics by pharmacists in Philadelphia was stated to be quite insignificant, and the subject was dropped.

The percentage compact between certain physicians and pharmacists created considerable discussion, in which prescriptions written in cipher were alluded to. No action was taken upon this subject, the difficulty being to reach the evil. On the subjects of prescribing over the counter, and the renewal of prescriptions, the views seemed to differ considerably. It was evident that prescribing over the counter is not encouraged by those present at the meeting, and as to the renewal of prescriptions it was thought by some that a printed request upon the prescription not to renew it without special order would not always meet the case. The abuse of dispensaries and other charities by able and even wealthy persons was likewise alluded to.

We trust that in the discussion of whatever grievances may exist, or be supposed to exist, a liberal spirit may prevail which does not shut the eyes against its own shortcomings. The misdoings of the grasping, illiberal and ungenerous in either profession should not be burdened on the profession, but on the individual where it properly belongs; and we apprehend that dark spots will not unfrequently be found in places where least expected.

The End of two Bogus Colleges.—On September 30th replications were filed in Court of Common Pleas No. 3, to answers submitted by the "Eclectic Medical College of Pennsylvania" and the "American University of Philadelphia." The answers of the defendants set out that they claimed to exercise their rights, privileges, franchises, etc., by virtue of an Act of Assembly, dated Mar. 26, 1867, incorporating the latter college, and an Act of February 25, 1850, incorporating the former.

It was to these answers that counsel for the Commonwealth filed replications. They aver that the above corporations have forfeited their charters, because of first, the conferring of degrees upon persons not possessing the qualifications such as are prescribed by their charters. Second, the sale of diplomas; third, the granting of degrees of Doctor of Medicine and antedating such diplomas, in order to make it appear that the recipients had the right to practice medicine; and fourth, the issuing of diplomas with forged signatures. After the replications were filed, counsel for both of the defendants confessed judgment of ouster in favor of the Commonwealth, and filed as a part of the record a letter from Dr. Buchanan, authorizing him to do so.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Proceedings of the California Pharmaceutical Society and College of Pharmacy, and Report of the Eleventh Annual Meeting, held at San Francisco, Jan. 9, 1880.

It contains the valedictory addresses delivered at the commencement exercises, November 16, 1879.

Proceedings of the Connecticut Pharmaceutical Association at the Fourth Annual Meeting, held in New Haven, Feb. 4, 1880. Pp. 75.

Among the papers read at the meeting and published we notice two lists of medicinal plants of Connecticut, which supplement each other. In one of the lists we find *Angelica archangelica* mentioned as growing in fields and damp places; we suppose that *Archangelica atropurpurea*, Hoffm., is intended, which is indigenous to New England and Canada.

Proceedings of the Second Annual Meeting of the Texas State Pharmaceutical Association, held in the City of Galveston, May 13 and 14, 1880.

The reports of officers and committees are of general interest to the pharmacists of the State.

Proceedings of the New York State Pharmaceutical Association at the Second Annual Meeting, held in Syracuse May 19 and 20, 1880. Pp. 146.

A brief account of the proceedings has been published on page 378 of the present volume. The pamphlet contains the stenographic report of the discussions.

Proceedings of the Tenth Annual Meeting of the New Jersey Pharmaceutical Association, held in Jersey City, May 19 and 20, 1880.

The pamphlet contains some interesting papers; in one, giving a list of medicinal plants, we notice an error, the botanical name of American jalap being given as *Ipomœa jalapa* instead of *Ipomœa pandurata*.

Proceedings of the Pennsylvania Pharmaceutical Association at its Third Annual Meeting, held in Allentown, June 8 and 9, 1880. Pp. 74.

An account of the transactions will be found on page 379. The pamphlet contains a copy of the report of the Committee on the Revision of the U. S. Pharmacopœia, covering 30 printed pages. This is the only report presented to the Convention at Washington by a State Pharmaceutical Association. A very good likeness of the first President of the Association, Mr. Chas. A. Heinitsh, is published with the "Proceedings."

Proceedings of the Wisconsin Pharmaceutical Association. First Annual Meeting, held in Madison, July 14 and 15, 1880.

We congratulate our friends in Wisconsin on the organization of their State society. It is pleasing to observe that one State after another is wheeling into line, and before long every State in the Union will have its pharmaceutical association, with annual reunions for the furtherance of the cause of pharmacy.

THE AMERICAN JOURNAL OF PHARMACY.

NOVEMBER, 1880.

SPECIES OF CINCHONA OCCURRING IN U. S. COMMERCE, AND NOTES ON THEIR MICRO-BOTANICAL DETERMINATION; WITH ORIGINAL DRAWINGS.

BY J. C. REEVE, PH.C.¹

Of the accessible literature on the subject of cinchonas, as a practical guide, the National Dispensatory of Stillé and Maisch has been found the most useful. This is because it states no doubts, excludes all barks but those that are at all likely to be met with here, and straightens out the frequent tangles of nomenclature. The aim of this paper has been to state experience in practical work done on a limited variety of barks in a limited space of time, and to aid, if possible, beginners in this field.

The bark of the genus *cinchona* consists of:

1st. The liber or inner layer (endophlœum) consisting of parenchyma, in which is found the liber fibres (*Baströhren* or *Bastzellen* of the Germans). The medullary rays (*Markstrahlen*) pass into the bark, dividing this layer into the bast rays (*Baststrahlen*). The *Füllgewebe* is the "filling tissue" of parenchyma of these rays. In the bast rays are also found the "staff cells," "staff-formed stone cells" of Berg's Atlas,² or incomplete fibres of the Dispensatory; synonymous terms, as shown by the fact that there is but one corresponding structure in the bark, and that the two writers use the terms interchangeably.

2d. The middle or primary layer, middle bark (mesophlœum, green layer), or outer bark. In the parenchyma of this layer are the laticiferous vessels (*Safttröhren* of Berg, *lacunæ* of Pereira), not anastomosing as in true laticiferous tissue, but separate, and mostly of large size. Here are also both thick- and thin-walled cells, containing a substance of resinous aspect; but undoubtedly it is only the thicker walled that are the resin-cells of the classification of the Dispensatory; the term

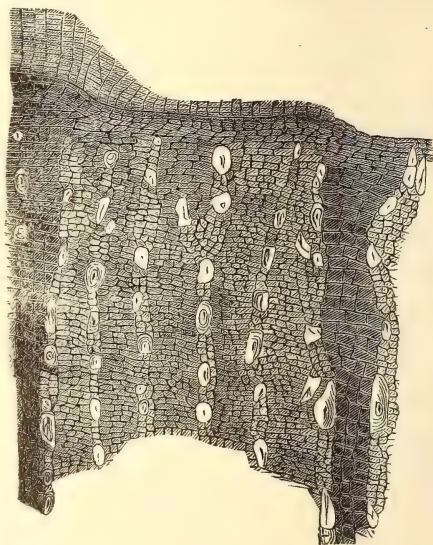
¹ Communicated by the Michigan University School of Pharmacy.

² "Anatomischer Atlas zur Pharmazeutischen Waarenkunde."

resin-cell in *cinchonas* is certainly limited to the thicker walled of the class. In support of this view the following may be stated: These cells have thick enough walls to be pronounced stone-cells; in Berg's classification resin cells do not appear, but the term stone-cell is used, and used only where the Dispensatory uses resin-cells. In addition,



Younger quill calisaya. x 40.



Older Calisaya. x 40.

we find in the Dispensatory, "Some species have . . . cells with thickened walls; . . . some of these cells contain a brown mass of resinous aspect, others are filled with crystals of calcium oxalate; hence the terms *resin-cells* and *crystal-cells*," and in the *Pharmacographia*¹ is found nearly the same expression. The conclusions are then, 1st, that

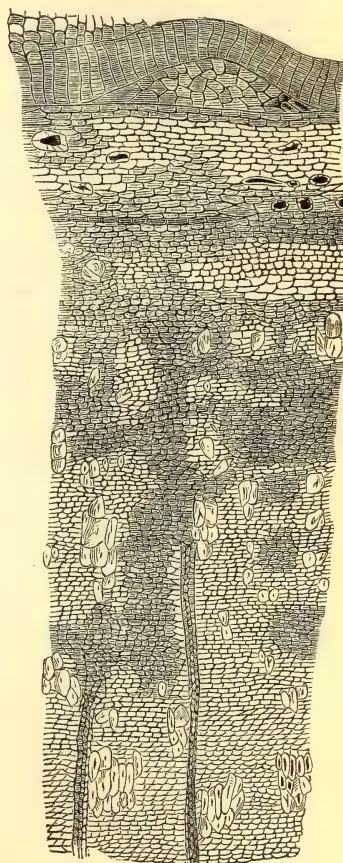
¹ Flückiger and Hanbury, p. 319.

under *cinchonas*, Berg's stone-cells and the resin-cells of the Dispensatory are the same, and therefore, 2d, that the "resin-cells" must be only the thicker walled.

The crystal cells, so often spoken of, are of little aid in classification. Their contents are granular, and slightly crystalline in appearance.



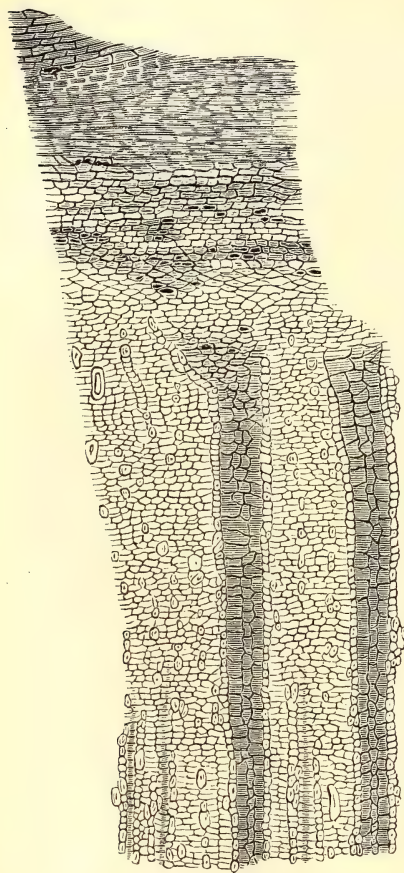
Cinchona succirubra. x 40.



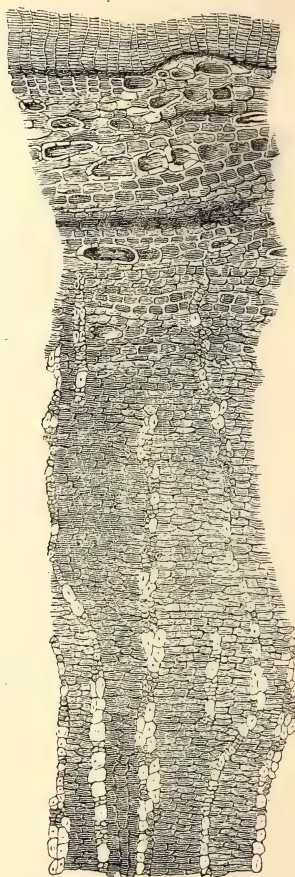
Cinchona micrantha. x 40.
(Older bark.)

3d. The corky layer, of varying thickness (periderm). Sometimes this penetrates into the middle or even inner bark, forcing off the tissue external to it as *bark-scales*, itself forming rhytidoma (periderm of Weddell, Borke of the Germans). This secondary cork, or the effects of its growth, is always observable in older *C. calisaya*.

On these structures the following key¹ is arranged as a guide to descriptions:



Cinchona pitayensis. x 40.



Cinchona lancifolia. x 40.

Resin-cells absent.

LATICIFEROUS DUCTS PRESENT (in young bark). *C. calisaya*: Thickest fibres observed average mm. .095 in diameter. Fibres mostly separate.

LATICIFEROUS DUCTS PRESENT (sometimes obscured in old bark (*C. succirubra*; thickest fibres average mm. .085 in diameter. Fibres in lines, and occasionally groups of 2 to 8.

LATICIFEROUS DUCTS PRESENT (soon obliterated). (*C. officinalis*.)

¹The key here given differs only slightly from that of the National Dispensatory or of Berg's Atlas, but the writer has included no statements which he has not verified, and has been able to make a few additions.

Resin-cells few or none (*i. e.*, they vary).

LATICIFEROUS DUCTS ABSENT. *C. micrantha*: Thickest fibres mm. .10 in diameter. Fibres in groups of 2 or 3, in older barks of more. Medullary rays thin and indistinct.



Cinchona cordifolia. x 40.



Cinchona purpurea. x 40.

C. pitayensis; thickest observed fibres average mm. .075. Thin fibres, mostly in single lines; section in places, or sometimes entirely light gray.

Resin-cells Present.

LATICIFEROUS DUCTS ABSENT. *C. lancifolia*: Thickest fibres average mm. .084. Numerous resin-cells. Fibres in lines, or groups of 2 to 4, with some staff-cells. Medullary rays large-celled.

C. cordifolia: Thickest fibres average mm. .073. Resin-cells few. Medullary rays large-celled. Fibres small (sometimes few), in mostly single lines of 2 to 4, with some staff-cells. In some regions the fibres are dark red-brown, becoming bright rose-red with KOH.

LATICIFEROUS DUCTS PRESENT. *C. purpurea*: Thickest observed fibres average mm. .106. Numerous resin cells. Medullary rays broadly wedge-shaped. Fibres in groups of 3 to 5, with some staff-cells.

(*C. pubescens*: Numerous resin-cells. Medullary rays broad. Fibres large, in groups of 2 to 3, with staff-cells.)

(*C. scrobiculata*: Numerous resin-cells. Fibres very numerous, in uninterrupted, usually single lines.)

(*C. glandulifera*: Few resin-cells.)

(*C. peruviana*: Resin-cells, laticiferous ducts and fibres small. Many fibres incompletely filled, in lines of 2 to 6.)

Of the species in parentheses we have had so few specimens that our acquaintance with them is necessarily slight.

The following portions of descriptions, used and noted in determining species, have been taken from Berg:

Covered C. calisaya,¹ Wedd. Bark from the branches in quills. On outside dark brown, in places milk-white, with longitudinal ridges and deep longitudinal- and cross-markings, which form hollow squares. Fracture short and brittle. Periderm hard, brittle and dark brown. Bast indistinctly radially striate. Periderm consists of flat, tangentially-stretched cells, which contain a reddish-brown substance. Middle bark consists of tangentially-stretched cells, which contain starch and a brownish red sap, which on drying adheres to the cell-walls. The parenchyma of the bast rays have the same contents as cells of the middle bark; occasionally, separate cells are filled with a crystalline powder of oxalate of lime.

Uncovered C. calisaya (or older bark). Flat, occasionally covered with brittle, dark brown *bark scales* in layers. Where these are absent are shell like indentures. Fracture short and brittle. Bast-cells distinct, in quite close radial rows. The *bark-scales* consist of alternate layers of periderm and dead bark, whose inner layers already belong to

¹That is, the bast covered with the middle and corky layers; usually the younger bark. When flat pieces have at least the laticiferous ducts left they belong to the variety *boliviana*.

the bast, consequently also containing bast fibres. The periderm consists of tabular cork cells filled with cinchona red. Medullary rays 2 to 4 rowed. Fibres are usually single, but occasionally in groups of 2 to 4, thick, often shortened, and yellow.

C. succirubra, Pavon. In flat pieces or quills, the quills covered on outside with a milky-white, longitudinally-furrowed, cross-marked periderm, which easily separates from the bast. Fracture fine. Quite thick middle layer of about 35 rows of thin-walled cells, filled with a deep-red coloring matter. Cells of the medullary rays are larger than those of the *Füllgewebe*. Fibres are orange, in places in interrupted rows, and are frequently tangentially arranged. In the older barks the cells of the smaller medullary rays can no longer be distinguished from the *Füllgewebe*, so that the broad bast rays are only bordered by the larger medullary rays.

C. micrantha, Ruiz and Pavon. Quills or flat pieces, the former mostly longitudinally-furrowed, the cross-markings faint, on outside grayish-brown, in some places ash-gray. Middle layer of young bark is contracted into a resinous ring; in older barks the periphery alone is darker. Middle bark consists of 25 to 30 rows of thin-walled cells, frequently containing a crystalline powder, usually without stone cells. The cells of the *Füllgewebe* are not conspicuously smaller than the cells of the wedge-shaped medullary rays. Fibres in interrupted rows; in older barks toward the centre thicker, separate, or in from 2 to 8, mostly 2-rowed groups.

C. pitayensis, Wedd. Curved plates or broken pieces, with a spongy, ochre colored, light- or dark-brown layered, square-cut, easily-removed cork, and a cinnamon-brown, hard, dense bast; underside finely striate, short and fine-fibrous. Middle bark of about 30 cell-rows. Medullary rays wedge-shaped. Cells of the *Füllgewebe* not noticeably smaller than those of the medullary rays. (On this point the drawing is not characteristic.) Fibres of uniform thickness in interrupted radial rows. (One variety contains a few stone-cells.)

C. lancifolia, Mut. Flat, curved, or *very seldom* quilled, of varying thickness, on outer surface with an almost silvery-white, faint ochre-yellow cork, somewhat glistening, very soft, easily removed. Bast ochre colored or orange-yellow, stringy; on fracture long and thin splintering. Middle bark with about 20 rows of cells. Fibres form single or double rows, not seldom found in groups, mixed with many

thin staff-cells. The thick-walled "sap-cells" (stone-cells) forming a coherent aggregation, are often found also in the outer bast. Cells of the medullary rays are larger than those of the *Füllgewebe*.

C. cordifolia, Mut. Flat, curved or in quills. Outer surface quite even, longitudinally-wrinkled or furrowed with soft, yellowish, somewhat shining, in places removed cork. Short fibrous. Bast with rows of fewer small fibres. Middle bark of about 35 cell rows. Bast rays with small-celled *Füllgewebe*. Fibres in interrupted radial rows, often in one region much more numerous than in a neighboring, sometimes *very scarce*.

C. purpurea, R. and P. Quills, with quite even, longitudinally-wrinkled cork, occasionally possessing tender cross-marks or even corky warts, yellowish-white or yellowish-gray (cork), in places of whiter color, later replaced by secondary cork. Middle bark of 35 to 40 cell rows. Two neighboring circles of laticiferous ducts, which later become filled up chiefly by endogenous cell-building, separate the bark from the bast. The wedge-shaped medullary rays generally contain stone-cells. The *Füllgewebe* consists of cells, which are smaller than the tangentially stretched cells of the medullary rays. Fibres gold- to orange yellow, indistinctly arranged in tangential zones, occasionally united in groups. Thin staff-cells are found in the *Füllgewebe*.

Of the barks obtained from leading wholesale houses of New York, Philadelphia, St. Louis, Detroit and New Orleans, and from eleven retail stores, 38 out of 63 were officinal species.

Of 22 barks sold as true red, 13 were *C. succirubra*, 4 *C. lancifolia*, 2 *C. purpurea*, 1 was *C. cordifolia*, 1 *C. peruviana* and 1 *C. calisaya*.

Of 11 specimens designated as red, ordinary red or commercial red, 2 were *C. succirubra*, 6 *C. lancifolia*, 1 was *C. peruviana*, 1 *C. scrobiculata* and 1 *C. purpurea*.

Of 15 barks sold as true calisaya, 10 were *C. calisaya*, 2 *C. pitayensis*, 1 was *C. lancifolia*, 1 *C. pubescens* and 1 *C. scrobiculata*.

Of 5 barks, ordinary or commercial yellow, 3 were *C. calisaya*, 1 was *C. officinalis* and 1 *C. pitayensis*.

Five pale or gray barks were found to be *C. micrantha* 1, *C. officinalis* 1, *C. pitayensis* 1, *C. calisaya* 1, and *C. glandulifera* 1.

Three pitayo barks were each *C. pitayensis*, and two barks sold as Columbian were found to be of the proper species of this commercial bark—*C. lancifolia* and *C. cordifolia*.

It will be seen that the yellow barks are much better than the red; 62 per cent. of the former, but 45·4 per cent. of the latter were officinal. The character of the wholesale barks is much better than of the retail; 50 per cent. of the retail and 51 per cent. of the wholesale were officinal; but the unofficial species of the wholesale houses were more frequently sold under their proper designations.

In connection with this, some reported assays of these unofficial barks might be interesting, though it is feared they have been made on commercial lots instead of on quantities in which every piece has had its botanical origin proved.

C. peruviana: Total alkaloids 2·06 to 6·25 per cent., mostly cinchonina and cinchonidia.

C. pitayensis: 3·2 per cent. quinia (Jamieson, "Pharm. Journ. and Trans.," Sept. 1, 1865), 1·15 per cent. quinia sulphate, 2·3 per cent. crystallized cinchonina (M. Guibourt, "Am. Jour. Pharm.," March, 1854, p. 185), 5·85 per cent. quinia sulphate, 4·19 per cent. quinidia and cinchonidia, 1·3 per cent. cinchonina ("Annales des Sciences Naturelles," vol. xii, series 5, p. 39).

C. lancifolia: 1·25 to 2·5 per cent. quinia sulphate, ·25 to 1·5 per cent. cinchonina sulphate (Karsten, "Pharm. Journ. and Trans.," Sept. 1, 1858), ·9 to 1·9 per cent. quinia sulphate ("Am. Jour. Phar.," March, 1854, p. 185), 1· to 3·5 per cent. quinia, 0 to 4·5 quinia; cinchonina and cinchonidia are quite prominent in some varieties, but wanting in others ("Ann. Sci. Nat.," vol. xii, series 5, p. 33).

C. scrobiculata: Quinia sulphate ·4 per cent., cinchonina sulphate 1·2 per cent., quinia ·44 per cent., quinidia ·63 per cent., cinchonina ·86 per cent. ("Ann. Sci. Nat.," vol. xii, series 5, p. 47).

C. cordifolia: Quinia sulphate 1·2 to 1·4 per cent., cinchonina sulphate ·5 to ·6 per cent. ("Ann. Sci. Nat.," vol. xii, series 5, p. 71).

(We have seen but one "spurious cinchona," genus *Ladenbergia*, species probably *magnifolia*, and this origin was indicated by its label—*Cinchona bicolor*.)

Ann Arbor, Mich., June 23, 1880.

ON THE STABILITY OF CALOMEL.

BY PHIL. HOGLAN.

The "Druggists' Circular" for August, 1880, contains some of the results of M. Verne's experiments on the stability of calomel, as reported in the "Bulletin de Thérapeutique." It is there stated that calomel, mixed with sugar, chloride of sodium or citric acid, undergoes no change, and also that the assumed danger of acid drinks, taken when using calomel, "is pure prejudice," since calomel in solution with citric acid for fifteen days underwent no change. M. Verne concludes from his experiments that calomel is a much more stable compound than generally supposed, and that chloride of sodium, at $40^{\circ}\text{C}.$, has no action whatever on calomel. That the subject of this article is a much vexed question the reader will readily see by referring to the U. S. Dispensatory, 14th ed., pp. 1247—8, where experiments are quoted to prove both the stability and the instability of calomel.

The following experiments were conducted for the purpose of ascertaining the correctness of M. Verne's conclusions, and also with a view to discover the cause of the discrepancies among different experimentalists on this important question:

1. Calomel was added to a solution of chloride of sodium and allowed to stand ten days with frequent agitation, after which the filtered liquid gave no evidence of the presence of corrosive sublimate by the stannous chloride test.

2. Calomel and chloride of ammonium, treated in the same manner, gave no evidence of corrosive sublimate being formed.

3. Calomel was added to a dilute solution of hydrochloric acid, and after twenty-four hours the filtered liquid gave a slight reaction with stannous chloride, indicating a trace of corrosive sublimate. The above experiments were conducted at a temperature of about $78^{\circ}\text{F}.$

5. A mixture of calomel and a solution of chloride of sodium was kept at a temperature of $98^{\circ}\text{F}.$ for two hours, then filtered; the filtrate gave a grayish coloration with stannous chloride, thus indicating the presence of corrosive sublimate, and showing that, contrary to M. Verne's conclusions, chloride of sodium acts on calomel even below $40^{\circ}\text{C}.$

6. Calomel and a solution of chloride of ammonium, treated in the same manner as in experiment "5," gave the same reaction.

7. Calomel and water were shaken together and kept at a temperature of $98^{\circ}\text{F}.$ for three hours, when the filtered liquid gave a slight

reaction with stannous chloride, indicative of the presence of corrosive sublimate, though not so marked as in the two preceding experiments.

8. Calomel and dilute hydrochloric acid were treated, at 98°F. , in same manner, and after one hour a very distinct grayish coloration was had with stannous chloride. The same occurred with citric acid.

Summary.—Experiment “7” shows that calomel, at the temperature of the body (98°), is slowly converted into corrosive sublimate. Experiments “5,” “6” and “8” show that chloride of sodium, chloride of ammonium, hydrochloric and citric acids further this change of calomel into the poisonous chloride, and are hence more or less dangerous when existing in the system with calomel. The result of the above eight experiments would seem to indicate that the different temperatures at which the experiments are conducted will explain in part the discrepancies on this subject. The experiments further show that at the temperature of the body calomel is an unstable compound.

The question of the conversion of calomel into corrosive sublimate by sugar, magnesia, bicarbonate of sodium and carbonate of magnesium was next taken up and the following experiments performed:

A. Calomel and sugar were rubbed together, and after twenty-four hours a test for corrosive sublimate failed to indicate its presence, and no trace of the poisonous compound could be discovered in the powders, even after fifteen days.

B. Calomel and magnesia, treated in same manner, gave evidence of corrosive sublimate after twenty-four hours.

C. Calomel and carbonate of magnesium gave same results as in experiment “B,” as did also calomel and bicarbonate of sodium.

The results of these experiments, except “A,” agree with the assertion of G. Velpins (*loc. cit.*).

These two sets of experiments would seem to prove that M. Verne’s conclusions are not altogether correct; that temperature is a great factor in considering the question of the stability of calomel; that M. Berthe’s statement (*loc. cit.*) in regard to the conversion of calomel into corrosive sublimate at high temperatures is correct, and prove also the correctness of M. Mialhe’s assertion that the alkaline chlorides increase the activity of calomel.

Newcomerstown, Ohio, October 11, 1880.

PHARMACEUTICAL NOTES.

BY R. F. FAIRTHORNE, PH.G.

Ointment of Oxide of Zinc.—A very smooth ointment can be made from the ingredients composing the officinal oxide of zinc ointment, if the oxide is first triturated and mixed with glycerin in a mortar, and after rubbing sufficiently long to produce a uniform mixture of the consistence of syrup it is incorporated with the lard. This will produce an ointment that is of satisfactory appearance, and does not become rancid; at least some of it made a month ago has not undergone any change, though exposed to the air and summer heat during part of that time. In connection with this subject, I would state that during that time of the year in which the thermometer indicates a temperature varying from 75° to 95° Fahrenheit the consistence of the officinal ointment is too thin for convenience of application in many cases, and by request of patients and physicians, I have frequently improved its condition by the addition of 40 grains of white wax to each ounce of the salve, and deducting that amount from the weight of the lard used. Another method, which has been successfully employed by Mr. Jas. T. Shinn, is to melt the lard and pass the oxide through a sieve, allowing it to fall into it, stirring the mixture at the same time, and until cold or hard enough to prevent separation. It is, perhaps, almost unnecessary to add that there is an advantage in employing lard that has been benzoated.

Making Soap by Cold Process.—A good hard soap can be easily produced if 4 pounds of olive or sweet almond oil are mixed with 2 pounds of soda ley, of the strength 36° Baumé, and stirred until of the consistence of thick paste, when it should be poured into moulds, covered by several folds of muslin, and kept in a warm room for 20 hours. By this treatment the process of saponification, or union of the acids in the oils with the alkali, is complete. When these materials are first mixed the temperature of the mass rises, and in order to effect the entire union of ingredients so as to form the compound called soap it is necessary that the heat thus generated should be maintained for some time, hence the necessity for covering the moulds and keeping them in a warm room.

I have found that it is desirable to use oil that is slightly rancid, or, if free from rancidity, to add about 10 per cent. of oil that has become so. Oil that is perfectly sweet requires two or three days to effect

saponification. Soap thus made, after a few days is as hard and dry as that article generally is when several years old when made in the usual manner.

A Substitute for Neutral Mixture can be made by placing the solid ingredients employed in making the solution of citrate of potassium in a mortar and rubbing them together with a small quantity of fresh lemon-peel, adding the water and straining through muslin. To each ounce of the solution 5 grains of sugar are added.

This forms an agreeable substitute for neutral mixture, quite as pleasant and efficient and more uniform in strength. The small amount of sugar added increases its resemblance to that made from the lemon juice.

Syrup of Orange Peel.—If two fluidounces of a tincture of sweet orange peel, prepared in the same manner and of the same strength as the officinal tincture of bitter orange peel, are mixed with fourteen fluidounces of simple syrup, a syrup is formed that is equally pleasant in taste and appearance to that made by the formula of the U. S. Pharmacopœia, containing about the same amount of alcohol, and free from the objection that may be made to that preparation on account of the presence of a small amount of magnesia, thereby rendering it incompatible with solutions containing alkaloidal and metallic salts.

INDEXING FOR PHARMACISTS.

BY CHAS. DYER CHASE, PH.G.

Few pharmacists know or appreciate the value of indexing; it is the best artificial memory known, and is useful in every trade and profession. It is common for men of affairs: lawyers, editors, statesmen and literateurs to have some system of indexing, although they vary in their methods.

This subject is one that has interested me for a number of years. I have tried one system after another, and finally settled upon the card index as combining in itself note-book, scrap-book, formula-book and index all in one. This is the system that is used by the large libraries in this country and in Europe in cataloguing their books, and is the one spoken of by Mr. Hans M. Wilder in his too short article in the "Journal of Pharmacy" for May, 1877. Perhaps some have never seen a card index, so I will simply say that mine is made of a good

quality of stiff ledger paper, cut to the size of postal cards, standing on edge like envelopes in a box, and arranged in a strictly alphabetical order; being put in loosely they can be moved backward and forward, swinging on their lower edges, and easily read without lifting from the box unless one wishes to. I do not see what Mr. Wilder's card press can be, nor do I see any necessity for one.

Note-books, scrap-books and others of that ilk are good enough so far as they go, but they do not go far enough; they are practically useless without an index, and how few of them ever have one. In using the index, as a scrap-book, I paste the scrap on a card, leaving room at the upper edge for a catch-word. If the scrap is too long for one side of the card I turn up the lower end and paste it upon the back; if too large for one card I paste it upon two, tying them together by the corners with a piece of thread. If too large for two cards I fold it, put it in a cheap envelope, and with a note of its contents, or a number on the upper edge, file it away in my envelope index, which is arranged exactly like the other, making a note of the fact in my card index. A box of cheap manilla envelopes can be bought at a very low price, and are much better than any scrap-book. If you *must* have a scrap-book do not buy a clumsy thing at the stores, but get some sheets of good stiff paper the size you want, number each sheet and paste your scraps *only on one side*, and as soon as you have done it do not forget to index it or it loses the most of its value. Index in this way: Squills, syr. of, S. B., 7._{2,4}; *i. e.*, syrup of squills, scrap-book, page 7, second column and fourth scrap (or still better, $\frac{4}{10}$ of the length of the column from the top).

The contents of my old note-books and books of formulas I have transcribed on cards, each item or fact upon a separate card and placed in my index—items or formulas that at one time were scattered around in different books so that it would have taken one a long time to gather them together for comparison, etc., are now in one place, and I can lay my finger upon any of them in a moment.

One advantage of having formulas written upon these cards is that they can be taken out and pinned up against the wall or shelf in front of the person using them, and out of the way of dirty hands, a wet counter or sloppy dishes; when done with they are put back in their proper place. When a formula has become out of date or is succeeded by a better one it can be thrown away and the new one put in its place. By going over it occasionally it is an easy matter to sift out what is no

longer of value—the chaff from the wheat. It is capable of indefinite expansion or contraction—unlike a book, it can be added to or taken from without interfering with its true alphabetical arrangement.

For a number of years I have been in the habit, when reading my pharmaceutical or other journals, of checking off with the initials of my name on the margin of the page (if borrowed on a piece of paper) such articles or items as I wished to bear in mind for possible future use ; on finishing the magazine I would go over it again, pen in hand, and index them. In checking I have used a red pencil, as I found that it more readily catches the eye when running the leaves between the fingers. The mark of a black lead pencil will often escape observation.

I always carry a supply of blank cards around with me in a pocket ; when I run against an item or fact that I want to preserve I jot it down with a stylographic pen, with an appropriate catch-word on the upper edge and reference at the bottom, and when I get home, instead of copying it into a book and burying it forever, I just slip it into its proper place in the index, and I know where to put my finger on it when it is wanted.

To facilitate reference I have some of the cards cut about a quarter of an inch higher than the others, with the letters of the alphabet or some catch-word upon the part that projects above. There are zinc guides made for the purpose, but they cost several cents a piece, and as I like to use as many as possible I find that the paper ones are good enough for a private index that is not to be handled by every one.

Fine calendered paper, demy, and twenty-three pounds to the ream, is about the right thing to use for the index cards, and a quire will cut about 500. I buy mine ready-cut and pay \$1.50 a thousand. In a small way it would be a good plan to get a tinsmith to cut out of good heavy tin a piece the size and shape of a postal card, by means of this one could cut or tear pieces of paper of the right size, and business notes, memoranda, etc., may also be rapidly torn or folded to a shape to fill in an index of their own.

I have just made a most convenient little paper weight to hold a book open when copying, or paper in place when writing upon it. I took a piece of square brass tubing, $\frac{3}{4}$ inch in diameter by 6 inches long, filled it with type metal, polished it with emery paper and gave it a coat of shellac. It weighs 20 ounces, and is the most convenient thing on my writing table.

Boston, September, 1880.

SHORTHAND FOR STUDENTS.

BY CHAS. DYER CHASE, PH.G.

The time is rapidly approaching, if not now here, when the student will be seen leaning over his desk and scratching away for dear life, trying to keep up with the remarks of the professor, who must, I think, find it extremely interesting work talking to the backs of so many heads.

Although I do not believe in so much note-taking at lectures, many do, and to lighten their labors a little I would suggest that they buy a little book entitled "Brief Longhand," by A. J. Graham, 69 Bible House, New York. It is "a system of longhand contractions, by means of which the principal advantages of shorthand are secured without resort to stenographic characters, and with perfect legibility."

A regular system of phonography, like Pitman's, Munson's or Graham's, is of course the best, but to the pharmaceutical student I do not think that the result obtained would repay for the labor necessary to its acquisition. This system of brief longhand, however, is so simple, so easily learned, and the benefits resulting so immediate, that I would recommend all students in the habit of taking notes to get the book and study it. I have found it of great benefit myself, not only in making abstracts, quotations, etc., but also in writing upon index cards, where I can get twice as much in the same space and do it twice as fast as I could formerly.

The system is divided into three styles; the first, or corresponding style, can be acquired by an hour's earnest study, and will save fifteen per cent. in time. The following is an example:

I call tt mind free wh s jealous v is own freedom, wh guards iself fr bng merged i oths, wh guards is empire over iself z nobler than e empire v e world.—*Channing.*

I call that mind free which is jealous of its own freedom, which guards itself from being merged in others, which guards its empire over itself as nobler than the empire of the world.—*Channing.*

The second style is simply the first with additions, and results in a saving of thirty per cent. Example:

I h oftn hd occsn t rmrk e frttde w wh wmen sstn e mst ovrwhlming rvrss v frtn. E dsstrs wh break dwn e sprt v a man, & prstrte hm i e dust, seem t clt frth -l e enrgs v e sfr sex, & g sch intrpdy & elevtn t thr chrc, tt -t times i apprchs t sblmty.—*Irving.*

I have often had occasion to remark the fortitude with which women sustain the most overwhelming reverses of fortune. The distresses which break down the spirit of a man, and prostrate him in the dust, seem to call forth all the energies of the softer sex, and give such intrepidity and elevation to their character, that at times it approaches to sublimity.—*Irving.*

In the third style contractions are employed to the utmost extent consistent with legibility, and the majority of the vowels and silent consonants are omitted.

"It is designed for use in all cases where legibility is secondary to the saving of time and labor, as in copying letters, in making abstracts of and quotations from works read, in rough-sketching business and literary papers, and in taking notes of testimony, lectures, sermons, etc.," and saves about fifty per cent. in time. Example:

Sm bks rtb tstd; os tb swld, &sm fw tb chwd & dgstd; tts, sm bks rtb rd -nly i prts, os tb rd bt n crsly; &sm fw tb rd whly &w dlge & -tn.—*Bacon*.

Some books are to be tasted; others to be swallowed, and some few to be chewed and digested; that is, some books are to be read only in parts; others to be read but not curiously, and some few to be read wholly and with diligence and attention.—*Bacon*.

These few examples will give a fair idea of the system; I might have made them fuller, but did not wish to take up too much space. As will be seen, the first and second style can be read at sight by any one, whether acquainted with the system or not, and the third by a little extra attention. The third style can be still further extended by the substitution of some of the phonographic word-forms for a few of the more common words; by this means, one can glide almost imperceptibly into a knowledge of phonography, while at the same time his brief-longhand is as valuable to him as ever.

In studying brief-longhand, I cut out Part I, put it in a stiff paper cover, and carried it around in my coat pocket, taking it out when I had opportunity (as at meal hours and in the evening in the intervals between waiting upon customers) and studied it; and the same with Part II. The book is cheap enough, costing only sixty-three cents; and if you want to keep a whole copy, buy another one. I am fond, myself, of little books, that can be put in a coat pocket and pulled out when opportunity offers.

Boston, October 5, 1880.

CHEMICAL NOTES.

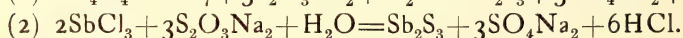
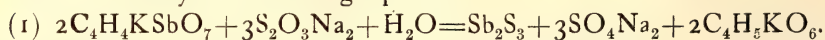
BY PROF. SAMUEL P. SADTLER, PH.D.

Inorganic Chemistry.—*Preparation of chemically pure Soda.*—According to an observation of Gerresheim, any chlorine or sulphuric acid which may be present in a soda solution is completely removed by

shaking up the solution with Millon's base, the product obtained by the action of ammonia upon mercuric oxide. Endemann and Prochazka propose to use this reaction for the preparation of chemically pure soda. For this purpose, they shake up some 2 liters of soda solution with 30 grams of the base once or twice daily for a week. As the free ammonia cannot be completely removed from Millon's base by washing, it is neutralized by adding mercuric oxide to the soda solution.—*Chem. Industrie*, iii, p. 273.

Preparation of pure Phosphoric Acid.—According to A. Ditte, pure phosphoric acid may be easily obtained by saturating a solution of sodium phosphate with hydrochloric acid gas, decanting the clear liquid from the precipitated common salt and distilling off the excess of hydrochloric acid.—*Comptes Rendus*, 90, p. 1163.

Red Antimony.—As the opinions concerning the composition of red antimony still differ, in spite of the manifold investigations recently made, and several new text-books class it among the oxysulphides, and others among the trisulphides of antimony, N. Teclu has undertaken a series of careful analyses of this compound, so as to enable him to decide this point and also to determine whether the product prepared, according to Wagner's method, from tartar, differs in composition from that obtained from chloride of antimony. It was found that red antimony in both cases consists merely of antimony and sulphur, its composition being Sb_2S_3 . Its formation by both methods may be illustrated by the following equations:



The formation of sulphurous acid, which is invariably observed during the preparation of this compound, and the presence of free sulphur in the product after extraction with carbon disulphide, point to the simultaneous result of a secondary process, which consists in the decomposition of sodium thiosulphate by means of tartaric or hydrochloric acid.—*Dingler's Polytech. Jour.*, 236, p. 336.

Detection of Water in Alcohol and Ether.—C. Mann gives the following process: Mix 2 parts citric acid and 1 part of molybdic acid; heat until incipient fusion and warm with 40 parts of water. Filter-paper dipped in this and dried at 100° is blue. In alcohol or ether free from water the color remains unchanged, but if water be present the paper will lose its color, especially if warmed.—*Ibid.*, 236, p. 430.

Vapor-density of Chlorine.—Victor Meyer gives the results of some

new determinations of the density of chlorine, made with the greatest care and with the elimination of all known sources of error. Instead of the value 1.63 previously given by him, he obtains now 2.05, a number still considerably lower than the normal density, 2.45. This shows that the abnormal change in the density of chlorine only takes place at a much higher temperature than that necessary for iodine. It may be, therefore, that the density of free chlorine (not liberated in *statu nascendi* from platinous chloride), when determined at very high temperatures, may change also to a degree. The experiments with free chlorine have not as yet been carried out at the highest temperatures. This Meyer proposes to do shortly.—*Ber. der Chem. Ges.*, xiii, p. 1721.

Organic Chemistry.—*On the Recognition and Determination of Traces of Carbon Disulphide.*—Prof. A. W. Hofmann gives a means of determining with accuracy very small amounts of carbon disulphide. The firm of Schimmel & Co., in Leipzig, had found in a large shipment of mustard oil received from Russia such amounts of carbon disulphide that reclamation was at once made on the ground of adulteration. The Russian firm then stated that in the preparation of mustard oil from *Sinapis juncea*, the variety used in Russia, carbon disulphide was necessarily formed. Prof. Hofmann, being called as an expert, testified that such large quantities could not be produced in the process of manufacture, but at the same time gave, as the result of experiment, the statement that small amounts were found in all the mustard oils, both natural and synthetical. Thus in oil from *Sinapis juncea* he found in two determinations 0.41 and 0.37 per cent.; in oil from *Sinapis nigra*, 0.51 and 0.56 per cent., and in artificial mustard oil, made from allyl iodide and ammonium sulphocyanate, 0.32 per cent. of carbon disulphide. These small amounts could be shown qualitatively by the aid of the xanthogenate of copper reaction, but not determined quantitatively. A means of determining even the slightest trace, with accuracy, was found in the use of triethylphosphin, which with carbon disulphide yields rosy-red prisms of the compound $(C_2H_5)_3PCS_2$. 100 parts, by weight, of this precipitate correspond to 39.1 parts of CS_2 . The occurrence of carbon disulphide in all the preparations of mustard oil, including that prepared synthetically, Hofmann ascribes to a secondary reaction, whereby a aqueous vapor first liberates hydrogen sulphide from the oil, and this, acting upon the allyl sulphocyanate, liberates carbon disulphide.—*Ibid.*, xiii, p. 1732.

On the Preparation of Tannic Acid.—The pulverulent tannin, as

brought on the market hitherto, is changed, in part, when dried into gallic acid, and therefore will not dissolve to a clear solution, is very hygroscopic, and forms in consequence, very readily, compact lumps, which make it difficult of solution. To avoid these points of difficulty, E. Schernig (Chemical Joint Stock Company) has patented a process whereby an aqueous, alcoholic or ethereal solution of tannin is evaporated *in vacuo* until, on cooling, the mass can be broken in pieces. These are placed in a double-walled vessel, heated by steam, the bottom of which is perforated so that the softened tannin on melting runs through. The threads of tannin fall upon rapidly rotating wooden or metallic cylinders placed some 5 meters below, from which the finished material is taken off and broken up. The brittle needles, of golden lustre, so obtained are not hygroscopic, do not form lumps, dissolve easily and in clear solution, and contain no decomposition products.—*Dingler's Polytech. Jour.*, 237, p. 480.

On a New Hydrocarbon from Sequoia gigantea.—G. Lunge and Th. Steinkauler have distilled with steam the needles from branches of the California *sequoia*, and, after extracting with ether, have separated therefrom a solid body and an oil. The solid is quite soluble in ordinary solvents, and could only be crystallized by putting a layer of water upon the solution in glacial acetic acid, so that by gradual mixing it might cause the separation out of the solid. In this way it was gotten in the form of well-crystallized scales, which were white, with faint blue fluorescence, and possessed a very penetrating odor of the sequoia, which here resembled somewhat the odor of oil of peppermint. The fusing-point was found to be 105°C ., and the boiling-point between 290° and 300°C . An analysis gave figures corresponding to the formula $\text{C}_{13}\text{H}_{10}$, to which confirmation was given by a determination of the vapor-density. While this formula is the same as that of fluoren, the fusing-point distinguishes it (fluoren has a fusing-point 113°C .), and the very characteristic odor leaves no chance of confusion between the two. The authors therefore call the new body Sequoien. The oil accompanying it they have not fully investigated as yet.—*Ber. der Chem. Ges.*, xiii, p. 1656.

On Apophyllenic Acid and Cotarnin.—In the decomposition of narcotin by oxidation with manganese dioxide and sulphuric acid, Wöhler obtained, besides opianic acid and cotarnin, an oxidation product of this latter substance, an acid containing nitrogen, which, because of the resemblance of its crystals to the mineral apophyllite, he named

apophyllenic acid. The conditions of its formation and its composition were not determined, however. It is difficultly soluble in cold, more readily soluble in hot water, insoluble in alcohol and ether. It fuses, with partial decomposition, at 241° to 242°C . An analysis gave figures corresponding to $\text{C}_8\text{H}_7\text{NO}_4$. On strong heating, it decomposes, giving a pyridinic odor. Heated with strong hydrochloric acid, in sealed tubes, to 240° to 250°C ., for two to three hours, it is decomposed, yielding the methyl group to the hydrochloric acid, and there remains a crystallizable acid, $\text{C}_7\text{H}_5\text{NO}_4$. A study of the salt of this acid shows it to be identical with the dicarbopyridinic acid of Hoogewerff and Van Drop (this journal, Aug., 1879, p. 397) or the cinchomeronic acid of Weidel (this journal, *loc. cit.*) The apophyllenic acid is simply the acid methyl ether of this dibasic acid. A pyridin derivative is therefore found among the decomposition products of an opium alkaloid, which makes it probable that the opium alkaloids, equally with the alkaloids of the cinchona bark, are to be considered as pyridin or chinolin derivatives.—*Ibid.*, xiii, p. 1635.

On the Official Quinia Test of the German Pharmacopæia.—O. Hesse publishes a criticism of Kerner's sulphate of quinia test (see this journal, 1880, p. 423, and 1862, p. 417), now the officinal German one. According to this test, if a clear solution remain after the addition of ammonia water, the quinia is practically free from cinchonidia sulphate. Kerner recently claimed to have improved this test so that $\frac{1}{10}$ per cent. of cinchonidia sulphate could be detected. This was to be done by adding ammonia solution in amount insufficient to dissolve the separated alkaloids, and then to determine volumetrically the amount of ammonia solution necessary for their complete solution. Hesse says that this test is worthless, inasmuch as cinchonidia sulphate, freshly precipitated, dissolves more readily in ammonia solution than quinia itself. Later, it is true, follows a separation out of crystallized cinchonidia sulphate, while the ammoniacal quinia solution remains clear. As the cinchonidia sulphate becomes an impurity in quinia sulphate, not by designed admixture, but because of its crystallization, so it is in a form in which it escapes to a greater or less degree detection by the Kerner test. Hesse then gives a table showing that in some preparations as much as 10 per cent. cinchonidia sulphate may be present, and yet a clear solution may result. He also considers that the amount of water of crystallization may indicate whether or not a sample of quinia sulphate is contaminated with cinchonidia sulphate. Pure sulphate of quinia, which is not effloresced,

contains 16.17 per cent. of water, while cinchonidia sulphate contains 13.7 per cent. of water; so that if a sample of quinia be not effloresced, and contain less than the 16 per cent. of water, it is because of admixture of cinchonidia sulphate.—*Ibid.*, xiii, p. 1517.

On Hyoscina.—Ladenburg made mention, some little while ago (this journal, July, 1880, p. 368), of the fact that *hyoscyamus* contained two alkaloids—a crystalline one, now known as hyoscyamina, and an amorphous one, which he had not as yet studied fully. He now describes this in full. It remains in the mother-liquor after the removal of the crystallizable alkaloid, and comes into commerce as a brown, thickish syrup. It can be extracted by the formation of the gold salt, which is less soluble than hyoscyamin-gold-chloride. The alkaloid, for which he proposes the name Hyoscina, when purified and decomposed by baryta water, gave tropic acid and a base isomeric with but distinct from tropia. In conclusion, the composition of the associated alkaloids is thus presented:

1. Atropia, $C_{17}H_{23}NO_3$, splits up into tropic acid, $C_9H_{10}O_3$, and tropia, $C_8H_{15}NO$.
2. Hyoscyamia, $C_{17}H_{23}NO_3$, splits up into tropic acid, $C_9H_{10}O_3$, and tropia, $C_8H_{15}NO$.
3. Hyoscina, $C_{17}H_{23}NO_3$, splits up into tropic acid, $C_9H_{10}O_3$, and pseudotropia, $C_8H_{15}NO$.
4. Homatropia, $C_{16}H_{21}NO_2$, splits up into mandelic acid, $C_8H_8O_3$, and tropia, $C_8H_{15}NO$.

—*Ibid.*, xiii, p. 1549.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY FREDERICK B. POWER.

Studies on the Constituents of *Scilla maritima*. By A. Riche and A. Rémont.—One of the authors, having been commissioned to report upon a fat employed as a rat poison, and which was found to contain squill, was led to extend his studies to the various constituents of the bulb.

They find that the bitterness of the bulbs is very different in comparing even the scales taken from the same portion, and that the juice may be saccharine, and not at all bitter. This circumstance could be attributed to the time of collection, to a variety of species, or to certain principles which are capable of undergoing modification. The latter is supposed to play an important part, and is attributed to a ternary principle, comparable to soluble starch, gum or to inulin, which they

have succeeded in isolating, and for which the name of *Scillin* is proposed, the name of *Scillitin* having been applied to the bitter, toxic principle. (The name *scillin*, as suggested by the authors, is an unfortunate one, having already been applied by Merck, of Darmstadt, to a crystallizable, toxic principle [see "Am. Jour. Phar.," Aug., 1879]). The *scillin* of the French authors was found to be readily converted into sugar, either by the action of acids as also, probably, by diastase or an analogous ferment contained in the plant. Being of itself not saccharine, the bitterness of the squill is supposed to diminish in proportion to its transformation into *lævulose*; the easy change of the *scillin* into *lævulose* explaining also why very little of that substance can be found in the dried powder, in which, on the contrary, sugar predominates.

The proportionate constituents of three bulbs taken at the same stage of development is then appended:

Proportionate composition.	Very bitter bulbs.	Slightly bitter bulbs.	
Water,	73.30	72.00	77.57
Cellulose and insoluble salts,	15.59	19.80	12.53
Scillin,	8.50	6.84	8.03
Sugar,	0.17	0.15	0.68
Soluble mineral matter,	0.32	0.24	
Scillitin,	2.12	0.97	1.19
Oxalic, citric and malic acids, }			
Undetermined substances.			

For the extraction of the *scillin* the expressed juice was neutralized by carbonate of lime, the decanted liquid distilled in vacuo in the presence of a little carbonate of lime, in order to neutralize the free acids, and then evaporated nearly to a syrupy consistence. By subsequent treatment with alcohol, the *scillin* was separated in the form of a syrupy liquid, which was removed from the supernatant layer by decantation, and purified by redissolving in water and again precipitating by alcohol.

The substance after successive treatment in the manner indicated, in order to remove all saccharine and mineral matters, was finally redissolved in a little water, and allowed to evaporate at a low temperature in vacuo. It was thus obtained in the form of a spongy, amorphous, yellowish-white mass, soluble in water in all proportions, but sparingly soluble in alcohol. Its aqueous solution was found to deviate to the left, and to possess no reducing action. It is not precipitated by neutral acetate of lead, and by the basic acetate only from concentrated solutions. Heated with nitric acid it forms no mucic acid, thus differing from gum, and is not precipitated by ferric salts, differing also from inulin by its free solubility in water.

By the action of dilute mineral acids the scillin was rapidly converted into a fermentable, strongly lævogyrate sugar, which was recognized as lævulose.

Submitted to elementary analysis, numbers were obtained approximating to the formula $C_{12}H_{10}O_{10}$, the deficiency in carbon found by the experiment being attributed to the small amount of inorganic matter which it still contained.

When dissolved in water it yielded with baryta-water a difficultly soluble barium salt, the analysis of which indicated the formula $(C_{12}H_{10}O_{10})_2BaO$, and which it is suggested may be utilized for the purification of the scillin.—*Journ. de Pharm. et de Chim.*, Oct., 1880.

(NOTE.—It would seem possible that the new substance described as scillin may prove to be identical with the *sinistrin* discovered by Schmiedeberg in 1879, and to have the formula $C_6H_{10}O_5$. The two substances agree in their amorphous character, non-reducing action and ready convertability into lævulose, although further comparative experiments would be necessary in order to prove their chemical identity.—POWER.

On the Products of the Distillation of Colophony. By Ad. Renard.—The products of the distillation of colophony, submitted to repeated fractional distillation, and then washed with caustic soda in order to remove several acids of the fatty series, furnished among other products a hydrocarbon, boiling at 103° to 106° .

To obtain it pure, it was again washed with caustic soda, dried over chloride of calcium, then left a short time in contact with metallic sodium, and finally distilled over a fragment of that metal in a current of carbonic acid gas.

Upon analysis numbers were obtained which led to the formula C_7H_{12} , which was confirmed by a determination of its vapor density.

This hydrocarbon, which the author calls *Hepten*, is a colorless, mobile liquid, possessing a peculiar odor, and is soluble in alcohol and ether. Its density at 20° is 0.8031 , and it is without action on polarized light.

When exposed to an atmosphere of oxygen, confined over mercury, it rapidly absorbs this gas, forming at the same time a very small quantity of carbonic acid gas.

It is without action on ammoniacal solutions of chloride of copper or nitrate of silver. Treated with chlorine it furnishes resinous products and disengages hydrochloric acid. Bromine acts upon it with violence

with the liberation of hydrobromic acid, but by allowing it to drop gradually upon the hydrocarbon, and allowing the mixture to remain in contact with an excess of bromine for two or three days in the dark, a thick liquid is obtained, which, after washing with an alkaline water in order to remove the excess of bromine, leaves a heavy, orange colored oil. The latter, treated with ether, furnishes a crystallizable bromated product, which may be purified by recrystallization from boiling ether, and the analysis of which leads to the formula $C_7H_6Br_6$. This body melts at 134° , and decomposes at about $150^\circ C.$ with the liberation of hydrobromic acid.

This body finally changes, by keeping, into an isomeric *hepten hexabromide*, which is an oily liquid.

Fuming nitric acid acts upon the hepten with great violence with the formation of resinous products. With nitric acid, sp. gr. 1.15, the action is slower, and does not commence until at about 80° , when it furnishes the ultimate products of the oxydation of organic matter.

Upon submitting to fractional distillation the products obtained at 200° to $250^\circ C.$ a hydrocarbon polymeric with the first-named, is obtained, boiling at 235° to 240° , and called by the author *Dihepten*, $C_{14}H_{24}$.

This hydrocarbon is very easily oxydized, and when exposed to the air becomes rapidly resinified. Exposed to an atmosphere of oxygen, confined over mercury, it absorbs this gas eight or ten times more rapidly than the hepten. Finally, the hepten is capable of uniting with the elements of water to form a crystalline hydrate, and which can be abundantly obtained by exposing for some time a small amount of the hydrocarbon, in contact with water, in loosely-stoppered vessels.—*Ibid.*, from *Ac. de Sc.*, 91, p. 419.

On the Presence of Vanillin in Crude Sugars.—The sugar which was employed for the purpose of analysis was obtained from a refinery in Bohemia. Two kilograms of the sugar furnished some drops of an oily liquid, possessing the strong aroma of the vanilla, and which it retained without alteration, even when exposed to the air for a month. From this liquid, by the proper treatment, a yellowish oil was obtained, which assumed a crystalline form after some time, but which, after being deprived of a yellow coloring matter, yielded finally but a very small amount of the pure substance. The substance, when pure, forms colorless stellate needles, possessing the decided odor and taste of vanilla. It is soluble in ether, alcohol, chloroform and naphtha,

less soluble in benzin and warm water, and very sparingly soluble in cold water. It melts at $80^{\circ}\text{C}.$, and its composition was found to accord with that of vanillin, $\text{C}_8\text{H}_8\text{O}_3$.

The vanillin is either formed through the influence of the lime, or liberated by that agent from a more complicated combination. It is also possible that the coloring matter plays a part in these reactions, but the nature of this substance is so little known that it is precluded from consideration. It is also the opinion of Mr. Stammer, who has devoted some study to this subject, that the cellular tissue takes part in the formation of the vanillin.—*Ibid.*

REMARKS ON THE TESTING OF MUSTARD OIL.

BY F. A. FLÜCKIGER.

The examination of a specimen of mustard oil, adulterated with bisulphide of carbon, which was performed at the request of Schimmel & Co. in Leipsic, led me to some observations, which may be connected with some communications of Hager ("Centralhalle," 1879, No. 39), on the subject of the same oil. (See also page 547.)

The adulteration was to such an extent, that, by heating the oil for one day in a water bath at a temperature not exceeding 80° , nearly one-fifth of the oil passed over, the distillate possessing very nearly the specific gravity of bisulphide of carbon, and, when warmed with alcohol and ammonia furnished very quickly the sulphocyanide of ammonium, which gave with ferric chloride the characteristic deep red coloration.

Treated in the manner indicated in my "Pharmaceutische Chemie," p. 42, with alcohol, caustic potassa and ether, the distillate above mentioned furnished the ethylxanthogenate of potassium, which was recognized by the beautiful yellow copper salt.

The liquid extracted from the mustard oil was, therefore, to be considered as bisulphide of carbon, although it was necessary to conduct the distillation at a temperature above 47° , in order to obtain approximately the entire amount.

The great mobility of sulphur in mustard oil has been known for a very long time, as may be seen, *e. g.*, from the statements to be found in Gmelin's "Handbuch der organischen Chemie," ii, 1852, p. 216.

It suffices, indeed, to warm pure mustard oil with a little alcohol and ammonia, and to remove the excess of the latter by heating in the

water bath, in order to obtain the sulphcyanide of ammonium. It follows herefrom that the sulphocyanide of iron reaction cannot be employed for the purpose of detecting bisulphide of carbon in mustard oil.

In order to obtain from pure mustard oil a metallic sulphide, probably always accompanied by sulphocyanide, it is not necessary to apply potassa, soda or ammonia; baryta water or lime water, even without alcohol, when warmed with mustard oil, accomplish the formation of the metallic sulphide, which may be detected by means of the nitroprusside of sodium. Even saturated solutions of carbonate of sodium are capable of extracting sulphur from mustard oil, forming therewith traces of sodium sulphide.

Mustard oil and ammonia combine to form thiosinammin, $\text{SCNH}(\text{C}_3\text{H}_5)\text{NH}_2$; 1 molecule of mustard oil = 99 gives 116 thiosinammin. 100 parts of mustard oil must therefore yield 117.7 parts of thiosinammin. I warmed 5 grams of the pure mustard oil, distilled by Schimmel & Co., with 2.5 grams of absolute alcohol, and 8.6 grams of ammonia water, sp. gr. 0.960, to about 60° , in a loosely stopped flask. After a quarter of an hour the mixture became clear, of a yellow color, and, at the expiration of an hour, the odor of the mustard oil had disappeared. Evaporated on a watch glass upon the water bath until no further considerable reduction in weight took place, the residue furnished upon cooling a white crystalline mass of thiosinammin, which, after drying completely over sulphuric acid, weighed 5.634 grams, or 11.2 per cent. of the applied mustard oil.

Other experiments, with slight deviation from this procedure, gave 11.1, 11.23 and 11.57 per cent. of thiosinammin.

Four grams of mustard oil, adulterated with bisulphide of carbon, furnished on the contrary only 3.6 per cent., *i. e.*, 90 per cent. of residue.

It is thus seen that the weighing of the thiosinammin, which can be obtained from a given specimen of mustard oil, is very well adapted for the determination of its value.

This very neat reaction is, however, accompanied by an unavoidable error. The action of the ammonia is, as one might expect, not confined to the formation of the thiosinammin, but the latter is always accompanied by some ammonium sulphocyanide. The amount of the latter is indeed very small, when a moderate heat and not much more ammonia is applied than is necessary according to the above formula.

It still remains to be studied under what conditions the formation of the sulphocyanide is most limited; presumably when the formation of the thiosinammin takes place in the cold, which in this case proceeds very slowly.

It would almost appear as if allylsulphocyanide could be formed of itself in mustard oil which has been kept for a long time, for while pure and fresh mustard oil is not changed by alcoholic ferric chloride, I have occasionally observed with old mustard oil that a red coloration takes place upon the addition of ferric chloride. As is well known, allylsulphocyanide boils at 161° , and passes by simple distillation into mustard oil; it was therefore sought whether by the action of a high temperature the reverse reaction did not take place, and the mustard oil assume the property of becoming colored by ferric chloride. This was, however, by no means the case with a specimen of mustard oil which was heated in a sealed tube to 180° ; the oil became darker, but mixed, as before, without change with ferric chloride. On the contrary, the oil when exposed in a sealed tube for three weeks to the action of sunlight, assumed a darker color, showed on the tube a brown deposit, and was then colored red by ferric chloride. It remains a peculiar fact, that the red colored compound, which is formed by the action of ferric chloride on old mustard oil, or on that which has been changed by the action of sunlight, is insoluble in ether, which is not the case with the sulphocyanide of iron.

If one will employ the formation of the xanthogenate of potassium as a means for the detection of bisulphide of carbon in mustard oil, the question arises, whether the latter itself does not also take part in the reaction. This is indeed the case, and with pure mustard oil, which has been shaken with an alcoholic potassa solution, a liquid is obtained which may lead to a deceptive conclusion, as it also contains some potassium sulphide.

Indeed the behavior of the xanthogenate of potassium to copper salts is so characteristic that the smallest amounts of bisulphide of carbon can be thus recognized; but, if mustard oil be present at the same time, the decomposition products, proceeding from the latter, will also give darkly colored precipitates with copper salts. Dr. Bertram, of Schimmel & Co., has found that very dilute potassa, shaken for a very short time with mustard oil, does not furnish these deceptive products of decomposition. Such a solution is obtained, according to him, by saturating absolute alcohol with caustic potassa, and diluting 20 drops

of the solution with 10 cc. of alcohol. Ten drops of mustard oil, adulterated with bisulphide of carbon, shaken with the above potassa solution for *one minute*, then supersaturated with acetic acid, furnishes a liquid, which with a solution of sulphate of copper produces a reddish-yellow precipitate. Pure mustard oil, treated in the same manner, shows always an undesirable turbidity, and after some time also a whitish deposit, which, however, cannot be confused with that produced by bisulphide of carbon, but which does not exclude with certainty all doubts.

It is consequently the most desirable, under all circumstances, to distill off the bisulphide of carbon, when the quantity present will admit, and particularly to determine its specific gravity and boiling point. In the case now before us, the adulterated oil had the sp. gr. 1.073 at 20°, while the same, after the above described process of distillation, approached the correct number, 1.021, and the specific gravity of the distillate was increased to over 1.20.

By the long preservation of the questionable adulterated oil by the side of a specimen of the pure oil, the remarkable fact was shown, that the former in the course of a few months, even in dispersed light, became colored very dark brown, and the bottom and sides of the flask become covered with a dirty, brown-red deposit, while the pure oil under the same circumstances underwent no change. In exposed sunlight, however, such a remarkable distinction is not manifest, as in this case the pure oil becomes also dark colored very quickly.—*Pharm. Post*, No. 17, 1880.

F. B. P.

CHEMISTRY OF BAST FIBRES.

By E. J. BEVAN AND C. F. CROSS.

A Paper read before the Owens College Chemical Society, 16th April. Published by Plamer & Howe, Manchester. See also *Chem. News*, p. 42, '77.

The authors' investigations have been confined to jute and esparto, the former as a peculiarly typical bast fibre, the latter as representing monocotyledonous growth.

The *inorganic* constituents of the normal jute fibre are—

(a.) *Water of hydration*, varying from 10 to 12 per cent. of its weight, with the temperature and hygrometric state of the air. It is to be regarded as dependent both on the chemical nature and structure of the fibre (chemical adhesion), although scarcely upon its external structure (capillarity), as conjectured by Sir W. Thompson.

(b.) *Ash*.—The general features of the inorganic skeleton of this fibre may be expressed by the following average percentage numbers: SiO_2 , 30—35; Fe_2O_3 , 5—8; Al_2O_3 , 5—6; Mn_2O_3 , 0·5—0·9; CaO , 13—16; $\text{K}_2\text{O} + \text{Na}_2\text{O}$, 5—10; P_2O_5 , 8—13; SO_3 , 1—5.

(c.) *Organic* (considered with exclusion of *a* and *b*).—Combustions of the fibre (purified by boiling in dilute ammonia; the fibre thereby sustains a loss of 1 per cent. of its weight, losing a resinous constituent, which causes the adhesion of portions of cortical parenchyma and the matting together of the fibres in the raw state), showed it to have the following aggregate (average) composition: C, 46·5; H, 5·80 Nitrogen is present only in minute quantity, *e.g.*, in a fair specimen (previously boiled in dilute sodium carbonate) the quantity determined was 0·053 per cent. The proximate constituents of the fibre are, *cellulose*, 70 per cent., as isolated by the ordinary methods, and *intercellular and encrusting substance*, 30 per cent.

Hugo Müller's method for the quantitative determination of cellulose gives satisfactory results with this fibre; identical results are obtained, but in a very much shorter time by substituting *chlorine* gas for the bromine-water, the fibre being boiled previously to chlorination in a weak alkaline solution. The action of the gas is to form a definite compound with the aromatic portion of the fibre, which is decomposed on boiling with ammonia, with formation of soluble products. Pure cellulose is obtained on once repeating this treatment, whilst if bromine-water is used several repetitions (5 to 6) are necessary. A modification of this method, involving points discussed in another connection, consists in boiling the chlorinated fibre with a solution of sodium sulphite (5 per cent.) for a few minutes, and subsequently with an alkali (a solution of potash, 1 per cent., is a better solvent for the products of decomposition, and its use does not affect the yield of cellulose); by the method thus modified pure cellulose is at once obtained. It is a remarkable fact that the yield of cellulose is, in this case, 5 per cent. higher than by either of the two previous methods. There is additional evidence to show that jute cellulose is a chemical aggregate, and therefore to a certain extent defined by the process by which it is obtained. The above-mentioned chlorine derivative is a definite compound, $\text{C}_{19}\text{H}_{18}\text{Cl}_4\text{O}_9$; it has been obtained and purified in different ways, but with constant analytical results. It is soluble in alcohol and glacial acetic acid, and is precipitated from its solution on the addition of water, in yellow flocks; it dries to an amorphous yellowish powder, which

has an odor closely resembling that of tetrachloroquinone. It further resembles this compound in dissolving in ammonia to a purple solution, changing to brown on standing. The analogies of this body to the quinone derivatives are unmistakable; the authors are therefore able to confirm Hugo Müller's observation of the presence of a body having the reaction of a quinone in the intercellular substance of bast fibres. The most striking reaction of this derivative is the development of a pure Magenta purple color, of great brilliancy when treated with a solution of sodium sulphite. This is best seen in the freshly chlorinated fibre; all bast fibres examined by the authors (flax, hemp, manilla, etc.,) gave the same coloration after chlorination. Upon the reactions of these bodies the method for the isolation of cellulose proposed by the authors was based, the chlorine body being converted by the sodium sulphite into soluble (reduction) products. Being a recent observation it is still under investigation.

A similar derivative was obtained from esparto. The brown solution, obtained by heating the substance under pressure with an alkaline lye, yields a flocculent precipitate when neutralized. After purification by twice dissolving in glacial acetic acid, and reprecipitating by water, it has the aggregate composition $C_{21}H_{24}O_8$ (it contains also 1.2 per cent. nitrogen). This body, on heating with hydrochloric acid and potassium chlorate, yields the chlorine derivative, $C_{22}H_{23}Cl_4O_{10}$, which is also to be regarded as formed from a complicated quinone.

The quinone of the jute fibre appears to be associated with a carbohydrate. By the action of dilute sulphuric acid (5 per cent.) at 80° , a soluble carbohydrate is formed, and is obtained after purification as a brown, sticky, hygroscopic solid, having the composition $C_{12}H_{18}O_9$. As no other products are formed the aromatic portion of the fibre resisting the action of the acid, and the loss of weight (23 per cent. in a certain case) falling to a large extent on the intercellular substance, this, it must be inferred, contains a carbohydrate. The same conclusion is arrived at by a study of the action of alkalies on the fibre and of a peculiar fermentation, which is induced under certain conditions of moisture and high temperature by which this portion undergoes resolution. The carbohydrate, associated with the quinone, is rather of the nature of cellulose than glucose; the fact that by a certain decomposition of the intercellular substance the yield of cellulose is increased, goes to show that a portion of the "aggregate" cellulose obtained is a product of such decomposition. The authors therefore

regard the intercellular substance of this bast fibre as a "cellulide," or more specifically a celluloquinone. Upon this constituent depends the integrity and remarkable dyeing capacity of the fibre: *pari passu* with its removal these disappear until in the isolated cellulose there is obtained a mass of disintegrated cells, having no affinity for coloring matters.

By the action of nitric acid (5 per cent.) this celluloquinone is entirely converted into soluble products. The aromatic portion of these are more conveniently studied in the analogous esparto derivative. From the solution obtained by digesting the acid on the resinous precipitate before described, a peculiar nitro-derivative was obtained. Concordant analyses of this body, in the form both of its barium and calcium compound, established the formula as $C_{25}H_{31}NO_{25}M''_4$. In the free state it is a powerful acid; it has an intensely bitter taste, and dyes animal fibres a brilliant yellow.—*Four. Chem. Soc.*, Sept., 1880, p. 667.

EMULSIONS.

BY A. W. GERRARD, F.C.S.

Demonstrator of Pharmacy and Materia Medica to University College.

This communication is the result of some experiments made with the view of determining what would prove the most valuable agents for general use to render oils, balsams, resins and oleo-resins in the form of emulsions. Also to arrange formulæ practical and reliable, for the most commonly prescribed substances required to be dispensed in the emulsion form.

The subject, I know, is one upon which much has been already said and written, and yet, withal, there exists amongst pharmacists a wide difference of opinion and practice as to the material or process which shall best emulsify any given oil. The truth of this observation may be demonstrated by giving the same prescription, say for $\frac{1}{2}$ an ounce of castor oil to be rendered into 2 ounces of emulsion, according to art, to six different chemists to prepare, the products will vary most astonishingly, no two being alike either in color or fluidity, and some not even emulsified at all. This want of uniformity in our art applies not only to emulsions, but various other preparations, and although some slight variations may be expected in preparations obtained from products themselves subject to natural variation, the difference is generally far too great to be explained on these grounds, and is often suffi-

cient to create suspicion or distrust in the mind of a patient, to whom no amount of explanation is satisfactory. This is matter for regret and enables me to make the observation that I believe the blame for much of this can be traced to a deficiency in pharmaceutical education, for it is a fact that actual practical pharmacy—I mean the real manufacture of preparations and practical use of apparatus—forms no part of the curriculum of our school. The remedy suggests itself.

The emulsifying agents most commonly employed and regarded with most favor are the mucilages of tragacanth and acacia, likewise their powders. My experiments have been confined to these substances, previous results having proven that where honey, yolk of egg and almond powder are recommended for special purposes, acacia or tragacanth answers equally well or better.

To decide the respective merits of tragacanth and acacia some forty experiments were conducted with each gum, both in powder and in mucilage, mixed with various oils and resins in various proportions, and by varied manipulation the results obtained being altogether in favor of powdered gum acacia, the emulsions it forms being perfect milk-like fluids, in which the eye cannot distinguish any particle of oil; they pour easily from the bottle and mix with water in any proportion without separation. Most of the forms given below have been kept for two months and show no deterioration.

For general instructions when using powdered gum acacia it is essential that it be of the best quality and almost white. The substance to be emulsified, if it be a fluid, must be measured in a dry measure and poured into a dry mortar; the necessary amount of powdered gum can now be well incorporated, next the portion of water indicated in each case, but by no means let it be measured in the oily measure. Now stir well, taking care that every particle of oil is brought within range of the disruptive mechanical motion; want of attention to this part of the operation is a frequent source of failure, for if any oil gets up the side of the pestle or mortar and is omitted from the emulsifying process it will most certainly show itself by floating upon the surface of the finished product, spoiling what might otherwise have been a perfect preparation.

When the substance to be emulsified is a solid or semi-solid body with resinous properties, it is advisable to dissolve it in twice its quantity of rectified spirit, then treat in the same manner as for fluids.

Syrups, tinctures and flavoring agents when ordered should, as a rule, be added last.

Emulsion of Codliver Oil.

Codliver oil,	.	.	.	.	4 ounces.
Essential oil of almonds,	.	.	.	.	4 minims.
Powdered gum acacia,	.	.	.	.	1 ounce.
Syrup,	.	.	.	.	1 "
Water,	.	.	.	.	to 8 ounces

Mix the gum with the oil, then place on the mixture 2 ounces of water and stir till the emulsion is formed, then add the remainder, water, essence and syrup.

Emulsion of Castor Oil.

Castor oil,	.	.	.	.	4 drachms.
Powdered gum acacia,	.	.	.	.	80 grains.
Essential oil of almonds,	.	.	.	.	1 minim.
Simple syrup,	.	.	.	.	2 drachms.
Water,	.	.	.	.	to 2 ounces.

Mix the powder with the oil, then add 2 drachms of water and stir till the emulsion is formed, add the remainder, water, syrup and essence.

Emulsion of Turpentine Oil.

Oil of turpentine,	.	.	.	.	4 drachms.
Powdered gum acacia,	.	.	.	.	2 "
Syrup,	.	.	.	.	2 "
Water,	.	.	.	.	to 2 ounces.

Mix the powder with the oil, add $\frac{1}{2}$ ounce of water and stir till the emulsion is formed, then add the remainder of the water and syrup.

Oil of turpentine is considered one of the most troublesome bodies to emulsify ; prepared by this form there is no difficulty.

Emulsion of Balsam Copaiba.

Balsam of copaiba,	.	.	.	.	3 drachms.
Powdered gum acacia,	.	.	.	.	3 "
Simple syrup,	.	.	.	.	6 "
Water,	.	.	.	.	to 6 ounces.

Mix the powder with the balsam and add 6 drachms of water, then stir till the emulsion is formed, gradually add the remainder of the water and syrup.

Emulsion of Resin of Copaiba.

Resin of copaiba,	.	.	.	.	2 drachms.
Rectified spirit,	.	.	.	.	4 "
Powdered gum acacia,	.	.	.	.	4 "
Water,	.	.	.	.	to 6 ounces.

Dissolve the resin in the spirit, add the powdered gum and mix well, add now an ounce of water, stirring till the emulsion is formed ; make up to 6 ounces with water.

Emulsion of Balsam of Peru.

Balsam of Peru,	.	.	.	.	3 drachms
Powdered gum acacia,	.	.	.	.	2 "
Simple syrup,	.	.	.	.	6 "
Water,	.	.	.	.	to 6 ounces.

Rub the powder well with the balsam, add 3 drachms of water and stir till the emulsion is perfect, then add the remaining water and syrup.

In emulsions containing resins or bodies heavier than water there is generally a sediment formed ; it is so with the two previous forms, but there is no aggregation into a hardened mass, and a slight shake of the bottle puts all right again.

Emulsion of Chian Turpentine.

Chian turpentine,	.	.	.	.	2 drachms.
Ether,	.	.	.	.	4 "
Powdered gum acacia,	.	.	.	.	2 "
Water,	.	.	.	.	to 6 ounces.

Dissolve the turpentine in the ether and filter, washing the filter with a drachm of ether, mix well with the gum and add $\frac{1}{2}$ ounce of water, stirring till the emulsion is perfect, lastly add the remaining water.

Attention has already been called to the superiority of acacia over tragacanth to emulsify Chian turpentine, and the statement cannot be disproved.

Many of these forms have been well tested and practically made by large classes of students, and the results have been most satisfactory.

Before leaving the subject I will say that no rule of thumb practice should be attempted in making an emulsion ; success may occasionally occur, but annoyance and waste of time and material is the invariable result.

In conclusion, powdered gum acacia in my hands has achieved the greatest success, and so far as I am concerned merits the distinction of being called the perfection of emulsifying agents.—*Pharm. Jour. and Trans.*, October 2, 1880.

THE RESTORATION OF DISCOLORED SYRUP OF IODIDE OF IRON.

BY THOMAS B. GROVES, F.C.S.

Numberless articles by accredited writers in the "Pharmaceutical Journal" and elsewhere have shown that the preparation of a nearly colorless syrup of iodide of iron is not a difficult matter, and there has been a pretty general concurrence in the belief that the process of the British Pharmacopœia leaves little to be desired. As to its keeping properties, there has been and probably there still is a good deal of difference of opinion; some going so far as to say that it keeps perfectly well, and needs no special precaution for its preservation, whilst others have devised elaborate ways of bottling and storing or chemical treatment intended to enable the pharmacist to dispense a creditable article when called upon by the prescriber. It is doubtless true that when made with pure sugar, a substance by-the-bye difficult at all times to procure, the syrup, when in reasonable demand, does keep fairly well, so well in fact that well accustomed dispensing establishments fail to see any difficulty in the matter. Such, however, is not the case with those who perhaps are not called upon to dispense the article once in a month, or even less frequently. Then on searching the cupboard it is often found that the syrup without *some* treatment is not presentable, and frequently it happens that for want of knowing what to do in the case the syrup is sacrificed and the patient incommoded. With the view of assisting my brother pharmacists when in this dilemma I venture to offer a few observations. I must, however, confess that instances have to my knowledge occurred where the pharmacist has not been too scrupulous, and ignoring the refinements of pharmacy has not hesitated to supply his customer with a discolored syrup. I have myself been hauled over the coals for supplying a colorless and comparatively flavorless article, "apparently not so strong as Mr. Dash's;" in fact have suffered for a time, as did George the First's cooks, who supplied his majesty's table with fresh oysters, "not so 'igh in flavor" as those to which his Hanoverian Highness had been accustomed.

The discoloration of syrup of iodide of iron is doubtless due mainly to the presence of free iodine; when turbidity is present there is probably also a basic persalt of iron in suspension which adds to the effect. To get rid of both of these it is only necessary to dilute the syrup with say a third of its volume of water, to boil briskly for a few minutes,

then filter through paper, and finally reduce by evaporation to its original bulk. The syrup will then have resumed its original appearance.

The strength of the preparation will not have been materially altered by this treatment, for it takes a wonderfully small quantity of iodine in the free state to color a large amount of liquid. Thus it will be found that one drop of liquor ferri perchloridi added to half a fluidounce of freshly prepared syrup of iodide of iron will produce in it the tint of golden sherry, to be completely dissipated by a few minutes' boiling. There is, I am aware, nothing new in this treatment by boiling, etc.; it has, I know, been mentioned already by some writer whose name I have unhappily forgotten, but whose useful though often unused suggestion has not escaped me.

I will now refer to some experiments I have recently made in the same direction, and having for their object the avoidance of the delay attendant on the process already mentioned.

The text-books tell us that when a persalt of iron is brought in contact with a soluble iodide, the salt is reduced to the proto condition, and free iodine is eliminated. It was at one time thought that under these circumstances a per-iodide was formed, but Mr. Squire, jr., some years since proved conclusively that such was not the case by showing that the color could be removed from such a liquid by simply shaking it with an ordinary solvent for iodine such as benzin or chloroform. If to such a liquid containing iodine in solution, caustic potash or soda be added, precipitation of ferric oxide will result, and the iodine will combine with the base of the precipitant. Applied to a discolored syrup of iodide of iron the process does not answer, and that in consequence of the sugar, as it appears to me, exercising a solvent action on the precipitated oxides. In fact it is after filtration more discolored than ever.

In a paper published in the ninth volume, second series, of the "Pharmaceutical Journal" ("Preservation of Syrup of Iodide of Iron"), I pointed out the effect produced by the presence in the syrup of a trace of phosphoric acid, how that by seizing at the moment of its formation the peroxide of iron and rendering it insoluble, it effectually prevented the reaction ending in the elimination of free iodine that would otherwise have resulted. Syrup, even dilute, will keep for years after being so treated, but of course one gets instead of the discoloration the slight turbidity occasioned by the deposit of perphosphate of iron; this however, being colorless and easy of removal by deposit or filtra-

tion, is of but little moment. Addition of phosphoric acid to syrup already discolored is of no avail; the mischief has been done and no persalt remains for it to act upon. If, however, previous to the addition of the acid, a few drops of liquor potassæ be stirred into the syrup the color disappears almost immediately, and, the acid being in slight excess, will not again return.

Thus I found by experiment that when to half a fluidounce of syrup discolored by one drop of liquor ferri perchloridi, I added enough liquor potassæ (the amount would vary according to the acidity of the syrup) to produce a distinct greenish coloration, the further addition of two drops of dilute phosphoric acid restored the syrup to its original tint.

The use of hyposulphite for this purpose is of course well known, but its employment is in my opinion not so recommendable as that I have just described.

The paper will, I fear, be regarded as simply hateful and utterly unorthodox by the few; but the many will, I hope, not be displeased to learn how of two evils to choose the least.—*Pharm. Jour. and Trans.*, Sept. 18, 1880.

IPECACUANHA WINE.

BY J. B. BARNES, F.C.S.

Upon looking over Dr. Dyce Duckworth's paper, read at an evening meeting of the Pharmaceutical Society in March, 1872, entitled "Notes on the Pharmacy of Ipecacuanha," it occurred to me that the wine might be improved by a modification of the plan proposed by Mr. Carteighe for the preparation of the acetum and the oxymel of ipecacuanha.

His prescription for the preparation of the acetum is to macerate an ounce of bruised ipecacuanha root in a fluidounce of acetic acid for 24 hours, pack in a percolator, and pour distilled water over it until one pint of percolate has been obtained.

The modification consists in evaporating the acetum thus obtained over a water-bath to dryness, and subsequent maceration of the dry extract in a pint of sherry wine for 48 hours, and filtration. By this means a rich brown solution is obtained, which, although made eight months since, has not thrown down the unsightly muddy sediment so well known to be the case when ipecacuanha wine of the Pharmacopœia is kept beyond a few weeks.

A white crystallized deposit of cream of tartar, however, made its appearance in about a fortnight, and the crystallization has gone on slowly ever since, but it differs very much from the muddy mixture of ipecacuanhate of emetia and cream of tartar which continually goes on forming in the wine of the Pharmacopœia.

By this treatment the emetia is converted into the acetate, which, from its superior solubility, complete solution is insured.

It would of course be more rational to use an alcoholic solution of emetia, which Dr. Duckworth states has the same therapeutical effect as ipecacuanha, but similar effects would be obtained by the use of a liquid extract made by exhausting the acetic extract with water containing 10 or 15 per cent. of rectified spirit.

This new wine is slightly acid, but to so trifling an extent as to be not at all likely to interfere with the action of alkalies which may be prescribed with it.

A four fluidrachm dose proved an efficient emetic when given to an adult.—*Pharm. Journ. and Trans.*, Sept. 25, 1880.

NOTES ON PAPAWE JUICE.

BY H. J. ROSE.

A casual paragraph, in a Jamaica paper, directed my attention, while in the island, to a statement that *Papaine* had been found to be a vegetable peptonizing agent. Without any available means of making experiments there, I brought up some of the juice, and the experiments since made confirm this statement, and even show that it acts also as a diastase.

M. Bouchut ("L'Opinion Médicale") gives as the result of his experiments, reported in full: "They prove that all organized tissues, even when they are living, may be peptonized by this substance, papaine, which is a vegetable pepsin. It acts upon the tissues of a living animal in the same manner as upon the albuminoid alimentary matters deposited in the stomach, or in a laboratory vase."

Dr. Peckolt ("Pharm. Jour. and Trans.," Nov. 1st and 15th, 1879; "Amer. Jour. Pharm.," Nov., 1879, p. 559) gives a full report of his analyses of the milk of the stem, leaves and green fruit of *Carica papaya*, made some ten years ago, during his residence in Brazil. The substance which he then isolated (by precipitation with absolute alcohol from a watery extract of the juice), *papayotin*, seems identical with

the *papaine* of M. E. Bouchut, and the results of recent experiments with it were that he found it dissolved an equal weight of roasted flesh or albumen.

The experiments which I have made on the effect of the juice on fibrin and albumen confirm the results of previous investigators; but I have also found that the dried juice possesses the property of converting starch into sugar, thus taking the part of diastase. I have not yet had time to follow up this subject, but, in the meantime, briefly indicate the experiments made, so that those who have more leisure may find ground for further research.

1. Five grains of starch was boiled in two fluidrachms of water, and, when cooled to 100°F., five grains papaw juice added, and the temperature maintained. In half an hour the solution was quite thin, and in an hour iodine no longer gave a blue coloration.

2 and 3. The same quantities were similarly treated with the addition respectively of 5 grains of glycerin and 5 minims of alcohol, with similar results.

4. Ten grains of starch, similarly treated, was decomposed by the same quantity, after a little longer action.

5. Fifteen grains nearly all decomposed under the same treatment.

6. Five grains starch, similarly treated, but allowed to cool, gave a similar result.

7. Five grains starch, similarly treated, with the addition of 3 minims of acid. hydrochlor. dil., showed but a slight action after three days.

In using any of the ordinary tests for sugar, the fact must be borne in mind that papaw juice itself contains saccharine matter, which must be determined before the conversion of the starch can be accurately ascertained.—*Canadian Pharm. Jour.*, Oct., 1880.

PAPAINÉ.¹

BY A. WURTZ.

In a former paper² the author described, in conjunction with Dr. Bouchut, a ferment which they had prepared by precipitating with alcohol the aqueous portion of the milky juice of *Carica papaya* after the formation of a coagulum, and to which they gave the name

¹ "Comptes Rendus," vol. xc, p. 1379.

² See "Pharmaceutical Journal" [3], vol. x, p. 283.

“papaine.” It was at the same time stated that it appeared probable that a fresh quantity of papaine was formed by the action of water upon the coagulum. In the present paper M. Wurtz describes the experiments undertaken with the object of settling this and other points.

125 grams of papaw juice obtained by incision of the green fruit were filtered and the residue pressed. The solution precipitated by alcohol yielded 0.89 gram of a papaine very rich in ash, and containing—deduction being made of the ash—45.62 per cent. of carbon and 6.72 per cent. of hydrogen.

The pressed pulp was triturated in a mortar with 125 grams of water, and after twenty-four hours thrown upon a filter. The residue upon the filter was triturated with a fresh quantity of 90 grams of water. The two liquors, concentrated in a vacuum with the addition of a few drops of prussic acid, yielded 2.3 grams of papaine. After these two washings the pulp, already much reduced, was submitted to two fresh washings with water (first with 142 cc. and then with 150 cc.), and the liquors, united and concentrated in a vacuum, still yielded 1.1 gram of papaine, being a larger proportion than yielded by the original juice. This papaine, which digested fibrin energetically, contained (deduction being made for ash) carbon, 49.77, and hydrogen, 7.21 per cent. It therefore presented a composition differing from that of the ferment dissolved in the original juice.

After these four washings the white pulpy residue, not very much being left, was again digested with 50 cc. of water, and the water afterwards placed with 10 grams of moist fibrin. At the end of two days only 8 grams of fibrin remained, and the liquid, after filtration, was precipitated slightly by nitric acid; the fifth wash-water, therefore, still contained a small quantity of ferment. After these five washings there only remained 5 grams of moist pulp, representing 0.564 gram of dry matter. 2.5 grams of this pulp put to digest with 10 grams of moist fibrin at 50°C., left at the end of two days only 6 grams of moist fibrin, and the filtered liquid gave an abundant precipitate with nitric acid.

In another experiment 100 grams of juice obtained by incision of the fruit were suspended in water, forming a thick pulp, which was washed three times with water. The washings were added to the first liquor and the whole concentrated in a vacuum and precipitated by alcohol. The papaine (No. I.) so obtained, which was very white,

was analyzed. The pulp that remained upon the filter was suspended in a large quantity of water. After filtration the liquid concentrated in a vacuum yielded a fresh quantity of papaine (No. II.), which contained, as in the previous case, a larger quantity of carbon.¹

	I.	II.	Deductions made for ash.	
			I.	II.
Carbon,	42.21	44.18	46.90	48.55
Hydrogen,	6.28	6.28	6.99	6.90
Oxygen,	10.00	9.00	...	...

It is therefore demonstrated that the pulp, after being freed by washing from soluble ferment that may be adherent to it, still yields, by the action of water, a ferment capable of digesting fibrin. It may be recalled here that the gastric ferment appears to be contained under an insoluble form in the pepsiniferous glands, for these do not yield it to pure water.

The analyses, just quoted, show that the soluble ferment of *Carica papaya*, such as is obtained in precipitating by alcohol the aqueous solution containing it, is not of a constant composition. Numerous analyses of crude papaine have, in fact, given very divergent results in respect to the proportions of carbon and nitrogen, the carbon varying between 46 and 53 per cent. and the nitrogen between 14 and 18 per cent., deduction being made for ash. The proportion of ash varied also; generally it was high, amounting to 4 per cent. and even more; in one case it amounted to 20 per cent. It was ascertained that the ash consisted chiefly of phosphate of lime; it yielded soluble salt to water, and sulphuric acid and a small quantity of potash have been noticed.

It follows from the foregoing that alcohol precipitates from papaw juice, fresh or digested with water, a principle of variable composition. This would not be surprising, as the ferment might be mixed with other amorphous principles, especially with albuminoid substances, modified by its action, *i. e.*, peptones. These peptones being more dialysable than the ferment itself, it might be hoped that the ferment would concentrate on the dialyser. Experience has shown, in fact, that the residue from dialysis yields a ferment richer in carbon, and not containing more than 1 to 3 or 4 per cent. of ash. The following are some analyses of the ferment so purified. It may be remarked that the white

¹ Analyses of the pulp exhausted by water, alcohol and ether gave variable results. This residue still contained nitrogen.

precipitate, obtained by alcohol, was exhausted by ether, then dried in a vacuum at 75°.

Papaine, purified by dialysis, deduction made for ash.

Carbon,	.	.	50.77	51.80	50.70	52.77
Hydrogen,	.	.	7.23	6.71	7.50	7.47
Nitrogen,	.	.	...	...	...	15.17

These analyses show that the product purified by dialysis approaches in its composition that of albuminoid substances, and this analogy is strengthened by the fact that papaine contains rather a large proportion of sulphur, in two specimens there having been found 2.61 and 2.2 per cent respectively.¹

The preceding analyses presented too much divergence to allow of the conclusion that the product is definite and homogeneous. Another mode of purification was therefore attempted. Albumen and peptones being precipitated by subacetate of lead it was hoped to separate them by this reagent, which precipitates crude papaine incompletely. To such a solution, therefore, subacetate of lead was carefully added until a portion, after filtration no longer gave a precipitate. The precipitate was separated and a current of sulphuretted hydrogen passed into the filtrate. This was blackened, but the lead sulphide was not precipitated in flocks. To separate it the liquid was concentrated in a vacuum, and alcohol added to it drop by drop, so as to carry down the lead sulphide with the first portions of the papaine precipitated. The deposit having been separated by filtration the clear liquid yielded to alcohol a white precipitate of papaine. Two experiments made upon crude papaine from different sources yielded specimens of purified papaine, which after exhaustion with ether and drying at 75°C. in a vacuum, gave—deduction being made for ash—

	I.	II.	III.
Carbon,	52.36	52.19	52.9
Hydrogen,	7.37	7.12	...
Nitrogen,	16.94	16.40	16.44
Ash,	2.60	4.22	3.40

The sulphur was not estimated, sulphuretted hydrogen having been used during the operation. A third specimen contained 1 per cent. less of carbon, when submitted to dialysis during twenty-four hours it gave the figures stated under III.

¹ The experiments were made with products that had been submitted to lengthened dialysis and should not have retained any more sulphate, but the figures obtained require to be checked.

It may be added that 0.1 gram of specimen III. digested energetically 5 grams of moist fibrin, even after having been heated to 105°C.

M. Wurtz considers that the preceding analyses demonstrate that the digestive ferment of *Carica papaya*, named "papaine" by himself and M. Bouchut, possesses the composition of an albuminoid substance. To the characters previously attributed to this substance he adds the following, which relate to papaine purified by subacetate of lead.

It is very soluble in water, in which it is capable of dissolving in less than its own weight, after the manner of a gum. The solution, even when dilute, forms upon agitation an abundant froth. The crude papaine redissolved leaves sometimes an insoluble white residue.

Solution of papaine becomes turbid upon boiling, without coagulating like albumen. When left to itself during several days it also becomes turbid, and if then examined under a microscope is found to be full of vibriones and bacilla.

It gives an abundant precipitate with hydrochloric acid, and the precipitate dissolves readily in excess of the acid.

Nitric acid, added in small quantity, precipitates thick yellowish flocks that dissolve in excess of the acid.

Neither ordinary phosphoric acid nor acetic acid precipitate it, but metaphosphoric acid gives a plentiful precipitate.

Prussiate of potash added to acetic acid gives a precipitate.

Corrosive sublimate does not precipitate immediately the solution of pure papaine, or only gives a slight turbidity; after a time the turbidity becomes more apparent. Upon boiling an abundant flocculent precipitate is formed.

Plumbic subacetate does not give a precipitate, or only causes a slight turbidity, soluble in an excess of the reagent. If excess of potash be added to the liquor and it be heated it becomes blackened in consequence of the formation of sulphide of lead.

Sulphate of copper gives a violet precipitate, which becomes blue upon boiling and dissolves in potash with a beautiful blue color.

Chloride of platinum gives an abundant precipitate as also does tannic acid.

Picric acid gives an abundant precipitate insoluble in excess of the reagent.

Millon's reagent gives a plentiful yellowish-white precipitate that becomes brick-red when slightly heated.

These characters, as will be seen, are those of albuminoid matters, with some variations, especially in respect to corrosive sublimate and subacetate of lead.

In its action upon albuminoid matters papaine approaches the pancreatic ferment named "trypsin," by M. Kühne, who has made a careful study of it. Unlike pepsin, trypsin appears to approach the albuminoid matters; its action upon the latter appears to be more energetic than that of papaine. Papaine dissolves large quantities of fibrin rapidly, even in a neutral liquid; but to get a liquor that will not give a precipitate with nitric acid it is necessary to use a relatively large quantity of papaine—for example, 0.3 gram for 10 grams of moist fibrin—and to prolong the digestion at 50°C. during twenty-four hours. In this case there remains only an insignificant residue of dyspeptone, very rich in mineral matters, and the filtered solution gives with nitric acid only a slight turbidity, that may be due to an excess of the ferment. Moreover, in all these digestions, besides the bodies precipitable by nitric acid and by alcohol, there is formed a certain quantity of more hydrated peptones that are soluble in ordinary alcohol, especially with heat.

The rapidity with which solutions of papaine become filled with microbes induced M. Wurtz to ascertain whether they intervene in the rapid liquefaction of fibrin by this ferment, but he finds that nothing of the kind occurs.

The solution of fibrin by papaine takes place in the presence of prussic acid, boric acid, and even carbolic acid; that is to say, in conditions that exclude the formation of microbes.

In conclusion, M. Wurtz adds that he has separated from the juice of *Carica papaya* a fatty saponifiable substance and a crystallizable nitrogenous principle in white mamelons. These remain in solution in the liquor from which crude papaine has been precipitated. Further information on this subject will be given in a future paper.—*Pharm. Jour. and Trans.*, Aug. 14, 1880.

JAPANESE ISINGLASS.¹

This substance, known in China and Japan under the name of Tjintioiw, has been described by Hanbury² as occurring in two forms,

¹ Abstract of a paper by Dr. Leon Marchand in the "Bulletin de la Soc. Botanique de France" [2], i., 287.

² Hanbury, "Science Papers," 1876.

the one consisting of quadrangular sticks, from 1 to $1\frac{1}{2}$ inch in diameter and 11 inches long, and the other in slender furrowed strips, only $\frac{1}{8}$ of an inch in diameter. The first form appears to be the rarest in commerce, and is usually not so white and transparent as the second form, although this is not always the case.¹

With a view to determining the algæ which enter into the composition of this article specimens were submitted to microscopical examination, those pieces being chosen which, from their opacity or less transparent and clean appearance, indicated the probability of containing fragments of algæ in an unaltered state.

The following species were thus detected :

Streblonema.—Fragments of a species of this genus, consisting of articulated branched threads of a brown color, were found attached to a piece of *Gelidium*, but the fragment was too incomplete to determine the species.

Scytosiphon lomentarius, J. Ag.—A portion of this phæosporous alga, presenting a portion of the tubular frond, with the peculiar constriction characteristic of this species, was found.

Sporacanthus cristatus, Kütz.—This plant was represented by a little mass of branchlets, composed of a single row of cells and terminating in points ; in some specimens cruciate tetraspores were found, the specimens corresponding well with Kützing's figure of the plant ("Tab. Phyc.," v., p. 24, t. lxxxii).

Ceramium.—The *débris* of algæ belonging to this genus were not rare, but the fragments met with were too incomplete to determine the species. One species, so far as can be judged from the presence of spines on the nodes, appeared to be *Ceramium ciliatum*, Kütz., l. c., "Tab. Phyc.," xii., p. 26, t. lxxxvi.

Centroceras clavulatum, Ag.—The specimen detected consisted only of two joints, but these presented such clearly defined characters that there could be no doubt the fragment belonged to the above-named species, since they exactly corresponded with Kützing's figure, l. c., xiii., p. 7, t. xviii.

Endocladia vernicata, J. Ag.—The *débris* of this alga was very rare. One of the filaments found exactly resembled that represented by M. Suringar ("Mus. Bot. de Leyde," vol. i, Algues de Japon, pl. xxx).

Gloiopeltis tenax, Turn.—Here and there in the jelly were found por-

¹ Specimens of this substance in laminæ have since been received from Japan, and contain the same algæ.

tions, not completely gelatinized, closely resembling this species, and the presence of ovoid cruciately divided tetraspores exactly like those belonging to this plant confirmed the determination.

Gelidium polycladium, Kütz.—This was found in the form of fragments, often very well preserved, and distinguished from *Gloiopeltis* by the intricate character of the filaments, resembling Kützing's figure of the plant, *l. c.*, tom. xix., p. 9, t. xxiv.

This species is frequently studded with the pretty diatom, *Arachnoidiscus ornatus*, Sur., which is abundantly met with in some specimens of Japan isinglass, and by the presence of which M. Menier detected the marine origin of some commercial currant jelly.

Nitophyllum?—Some portions presented a flat frond and hexagonal areolation, which recalled the structure of *Nitophyllum*. These, however, were found only in very small quantity, and in a badly preserved state.

Polysiphonia tapinocarpa, Sur.—This alga was met with in the form of little sections of filaments, consisting of short joints which, on transverse section, showed ten siphons, and I do not doubt belong to the above species, as figured in "Algæ Japonicæ," 1870, p. 37, pl. xxv., B. Some fragments of *Melobesia*? were found on this plant.

Polysiphonia fragilis, Sur.—This species is represented by Suringar on the same plate as the last, fig. A. It is distinguished from the last by showing only five tubes in the transverse section.

Polysiphonia parasitica, Grev.—This species has not apparently been yet found on the coast of Japan, but from the fragments possessing eight or nine siphons, and from other characters which were well preserved in the specimen examined, there can be but little doubt that they belong to the above species, as figured by Kütz., *l. c.*, xiii., p. 9, t. xxvi.

Diatomaceæ.—I have found a large number of species belonging to this group, but especially *Arachnoidiscus ornatus*, Ehr., described and represented by M. Suringar, "Algæ Jap.," fasc. iii., p. 5, pl. i., and by M. Menier.¹

The above are by no means the only species which enter into the composition of Japanese isinglass, but a large number of others, which were observed to be different, were too damaged to be recognizable. The two forms of the article seem to be made with the same algæ,

¹ C. Menier, "Falsification de la Gelée de Groseille du Commerce découverte par les Diatomées," Nantes, 1879.

so far as it is possible to judge from the species found in them, but with this difference, that in the quadrangular form *Gloiopeltis* seemed to be the chief ingredient, while in the slender sticks *Gelidium corneum* was most abundant. This, however, may not be the case in all samples. It seems probable that the Japanese and Chinese search their coasts for such algæ as furnish mucilaginous substances, and having collected them, do not trouble themselves to remove the parasites which are attached to them, or less gelatinous species which are entangled with them, and thus the quality of different specimens varies considerably. If the gathering consists almost entirely of *Gelidium*, *Gloiopeltis* and *Endocladia*, the transparency, whiteness and purity are very noticeable.

The name of Japanese isinglass, inasmuch as isinglass (ichthyocolla) means fish glue, is objectionable, and should not be retained. The name Agar-agar, which has by some writers been proposed for it, has no better claim, since it is applied to various algæ which are not known to enter into the composition of this substance.

According to Mertens ("Preussische Exped. nach Ost Asien, Die Tange," 1866, p. 140), the following species are employed in the East Indies, under the name of agar-agar: *Eucheuma spinosum*, J. Ag., *Sphærococcus serra*, Kütz., *S. gelatinus*, Ag., *Gigartina horrida*, Harv., and at Timor, *Hypnea divaricata*, Grev.

The term gelose is also objectionable, on account of being applied to a definite chemical substance.

The name phycocolle or seaweed glue would be preferable, unless the name tjintiw or lo-thâ-ho be preserved.—*Pharm. Jour. and Trans.*, Aug. 14, 1880.

CHIAN TURPENTINE.

BY WILLIAM MARTINDALE.

Since I published some notes on the above drug ("*Pharm. Jour.*" [3], vol. x, p. 854)—which still is much in request, and until lately not to be had in the market, although some of the genuine article is now offered at a high price—I have received the following account of it, and the probable supply this season, from M. D. Spadavo, French Consul at Chio. The account tallies pretty well with that which I published before, and the supply, although not large this year, could, if required, be much increased.

"I am happy to give you the information you require relating to Chian turpentine. This drug has not been collected in our island for

many years, and I believe the greatest quantities of Chian turpentine sold as such in England were mere falsifications or another kind substituted for it. Chio may possess about 1000 turpentine trees, some exceedingly old—up to eight hundred or nine hundred years—and varying from $\frac{1}{2}$ yard to 10 and 12 yards in circumference. These trees when well cultivated may give from 2 to 3 kilograms of turpentine (a year?).

“The turpentine is collected by incisions made in the trunk of the tree about April, which are renewed every year.

“The fruit of this tree when ripe is collected and pressed in the same way as the olives; it gives a magnificent oil, very much liked by the inhabitants and often employed instead of butter. As soon as the fruit begins to get ripe the flow of the turpentine ceases. This happens about the middle of August.

“This year the inhabitants have been surprised to receive orders for the collection of turpentine, as it has been asked for in England and bought at the rate of 6s. the oke (or 1600 grams). The island has not produced over 700 or 800 kilograms this year, as many have not been informed in time to incise the tree. Owing to its cheapness the possessors of these trees do not give themselves too much trouble in collecting it clear, and they let it flow on the sand, which is taken with it. We have not the means to get it cleared and are obliged to send it as it is collected.”

The above is dated, “Chio, 18th September, 1880.”—*Pharm. Jour. and Trans.*, Oct. 2, 1880.

VARIETIES.

Tonic Glycerin.—Dr. Larmaude finds the following an excellent substitute for codliver oil with patients who cannot take that remedy: Pure glycerin, 300 grams; tincture of iodine, 30 drops; iodide of potassium, 30 centigrams. A tablespoonful a quarter of an hour before each meal. The appetite soon returns, and constipation, when present, soon disappears. For children and delicate persons, he employs 50 grams of syrup of raspberry and 250 of glycerin.—*Rev. Méd.*, April 3, from *Med. Times and Gaz.*, April 24, 1880.

An Improved Nitrate of Silver Caustic.—A writer in the “Medical Times and Gazette,” Dr. Sawostizki, has called the attention of the Moscow Surgical Society to an improvement in the preparation of sticks of nitrate of silver. It con-

sists in melting together 5 parts of nitrate of silver with 1 part of nitrate of lead, forming an argentum plumbo-nitricum. Sticks formed of this are preferable to those of the ordinary nitrate, as they are not easily broken, and can be pointed just like a lead pencil.—*Medical and Surgical Reporter*, from *Ibid*.

Oil of Mustard in Malarial Fever.—Haberkörn ("London Medical Record") has very successfully used the ethereal oil of mustard, on account of its anti-bacterial properties, in the pernicious fevers of malaria. He gives two or three drops a day in a great quantity of distilled water; or better, from two to four drops in a ten per cent. alcohol solution. His results have been "most remarkable."—*Louisville Med. News*, June 3, 1880.

An Innocent Powder for clarifying and partially decolorizing wines, liquors, vinegar, etc., is made by Dassori by mixing 30 kilograms albumen, 300 grams neutral potassium tartrate, 500 grams alum and 70 kilograms ammonium chloride, and is used like albumen, 60 grams of the mixture being sufficient for 2 hectoliters; it ought to be first beaten carefully with cold water, but never directly with the liquid to be clarified. The liquids thus clarified never become turbid again.—*Pharm. Centralh.*, December 25, 1879, p. 479, from *Chem. Ztg*.

A very Concentrated and at the same time mild Soap, particularly well adapted for washing fine fabrics having a delicate color, is made by rasping ordinary soap into very fine shavings (as fine as sawdust), drying the latter on wire screens placed in a warm place, grinding into a fine powder and pressing this, either directly without any addition, by very strong pressure into bars, or adding to the powder sufficient ox gall to make a solid mass, which is then shaped into bars like ordinary soap. If ox gall is added, it must be previously beaten into a uniform mass.—*Pharm. Centralh.*, December 25, 1879, p. 479, from *B. Polyt. Notizbl*.

Oleoresin of Male Fern is considered a harmless tapeworm remedy by many practitioners, while others believe it to be too powerful for delicate constitutions (see "Amer. Jour. Pharm.," Dec., 1879, p. 598). Dr. Pfeifer administers successfully, in nine cases out of ten, the following:

R	Extr. fil. maris æth.,	.	.	.	.	.	2 drs.
	Mucil. gum acaciæ,	.	.	.	.	.	q. s.
	Aquæ cinnamomi,	.	.	.	.	.	5 ozs.
	Syr. aurantii corticis,	.	.	.	.	.	1 oz.
M. D. S. To be taken in three doses.							

Dr. v. Hauff also claims successful removal of tænia by administering it, while Dr. Erlenmeyer reports a very unsuccessful treatment, resulting in removal of the tænia without its head, followed by strong nausea, vomiting, diarrhoea, fever, fainting, diaphoresis and intestinal catarrh, lasting for over six weeks.—*Pharm. Ztg.*, Nov. 26, 1879, p. 734, from *Wuertt. Med. Corr. Bl*.

Pilocarpin in Asthma.—Berkart recommends the administration of pilocarpin in attacks of asthma. "The powerful revolution which pilocarpin produces in the

distribution of the blood must necessarily have a very beneficent influence in some forms of asthma; for, by attracting a large volume of blood to the skin and to the salivary glands, and by diminishing its volume through the copious perspiration and salivation, the congested internal organs are relieved in a corresponding degree."

Within a few minutes there is marked improvement both in subjective symptoms and physical signs. Alarming symptoms may be developed in cases where there is fatty degeneration of the heart, but these will soon subside spontaneously, or may be relieved at once by a subcutaneous injection of 1-120th or 1-60th grain of atropin. The dose of pilocarpin should not exceed one third of a grain. Berkart never gives more than 10 drops of a 2 per cent. solution. During the action of the drug the patient should preserve the recumbent posture—which the almost immediate relief will enable him to do—and he should be carefully watched until the effect has passed off. It is well also not to use pilocarpin soon after the patient's meals.—*Brit. Med. Journ.*, June 19, 1880, from *St. Louis Courier of Med. and Collat. Sci.*, July, 1880.

To Preserve and Renovate Rubber Instruments.—It is well known that many articles and instruments made of rubber are apt to become dry with time, and to crack, grow brittle and lose all elasticity. According to a Russian journal, this may be prevented by the use of a simple mixture of 1 part aqua ammoniæ with 2 parts of water, in which the articles should be immersed for a length of time, varying from a few minutes to one-half or one hour, until they resume their former elasticity, smoothness and softness.—*The Druggist*.

How Nature Moulds her Living Forms.—What does the story of life upon the earth teach us concerning the unfoldment of organic form? Is the human figure a chance-result of an evolutionary force which might have pursued some quite different direction; or are the laws of development such as to lead inevitably toward the form of man as their highest organic product? This is a question admitting of a more definite answer than may at first thought appear, as we hope to show by a rapid survey of the various steps of the process.

And, first, it must be borne in mind that Nature's efforts at animal and plant formation have been on no contracted scale. The varying forms produced have been almost multitudinous. They exist at present in the greatest variety. But the present is only the apex of a long succession of life-epochs, each with its special organic group. We must multiply the existing forms for thousands of such epochs to obtain any adequate idea of the whole broad field of life. Plainly, then, Nature has not dealt sparsely with the subject, but has produced a most generous profusion of differing forms. Hence, narrow as is the field of the earth, there is reason to believe that the form-evolving principle has had full opportunity here to act, and that it has selected out the most favorable line of development from the many directions attempted.

Life is an incessant battle—a battle for food, and a battle for safety. The total quantity of food is limited. The powers of organic increase are unlimited. Thus a fight for food becomes necessary; a conflict in which no quarter is asked and none given. Victory inclines to the strongest and best armed. The successful combatant must have powers of defence against all Nature's attacks, and of assault against all Nature's defences. In other words, the organism best adapted to its environment will win.—CHARLES MORRIS in *Popular Science Monthly* for November.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, October 19, 1880.

The meeting was called to order by the president, Dillwyn Parrish. This being the first meeting of the series an election of a Registrar was ordered, when, on motion of Prof. Sadtler, T. S. Wiegand was re-elected.

The minutes of the last meeting, held in May, having been read and no objections being made thereto they were approved.

Prof. Remington, on behalf of Dr. Manlius Smith, of New York, presented to the College, for the cabinet, a specimen of the unripe fruit of the *Conium maculatum*, which is being recommended for exclusive adoption in the new edition of the United States Pharmacopœia, and also a specimen of *Veratrum viride*. The thanks of the College were directed to be returned for the same.

Mr. W. B. Webb stated as a matter of experience with the method of *preparing cerates*, noted in the minutes of the last pharmaceutical meeting, that he had failed to obtain as good results by the process as with that which is now official.

Dr. F. B. Power exhibited three specimens of the oil of *Asarum canadense*, one by Schimmel & Co. of Leipsic, Germany, one by Dr. Squibb and one distilled by himself. This oil is now made quite largely for perfumers' purposes, in soap making, flavoring tooth washes, and said also to be one of the constituents of Hoyt's German Cologne. By fractional distillation it is separated into several distinct portions, that coming at the lowest temperature being isomeric with oil of turpentine and the next having the composition of Borneo camphor. That which is fractioned at the highest temperature is at first of an intensely blue color and is doubtless quite complex in composition.

Dr. Power also exhibited some specimens of the liquid constituents of oil of peppermint. The odor is due entirely to the menthol camphor.

In this connection Prof. Sadtler stated that in a recent chemical journal an account of a dispute relative to some *oil of mustard* was noticed. Messrs. Schimmel & Co., having purchased a quantity of it, found, upon transferring it to other packages, some of it exploded, and examination proved that carbon bisulphide was present largely. This induced reclamation upon the part of Schimmel, as a fraud had been perpetrated. In reply it was alleged that the oil was obtained by using the seed of the *Sinapis juncea*, and not the *S. nigra*.

Experiments made by Prof. Hoffmann, to whom the matter was referred, as a chemical expert, showed that all oil of mustard, whether made artificially or extracted from any of the varieties of *Sinapis*, contained carbon bisulphide, but in such small proportion as to be immaterial, while the large amount contained in the oil in question was doubtless put there as an adulteration.

Dr. Power stated that he had seen some of this oil, which had been sent to Prof. Flüickiger for examination, and that the conclusion Prof. F. arrived at was that distillation was the only reliable means of determining the quality of such oil.

Prof. Maisch gave the meeting an account of many of the places he had visited while in Europe, stating that, his object having been rest and recreation, he had not charged himself with sight-seeing as much as he would have done had he gone abroad for a different reason. He had visited a number of pharmaceutical schools

and many prominent pharmacists and chemists in England, Holland, Belgium, Germany and Switzerland, and briefly described the institutions he had visited. He also exhibited an elastic bandage, woven like hosiery, which is extensively used in Europe, and a small mill for grinding pepper as wanted at meals.

There being no further business, on motion, adjourned.

T. S. WIEGAND, *Registrar.*

EDITORIAL DEPARTMENT.

The next number of the Journal, as we have previously informed our readers, will contain besides the index of the present volume also the general index of the last ten volumes; its preparation involves a great deal of labor, and, although much of the work has been done, it is likely that the appearance of the December number may be delayed for a few days, for which we ask the kind indulgence of our friends.

Philadelphia College of Pharmacy.—The following extract from the minutes of the meeting, held September 27, 1880, was accidentally omitted in our last issue: The following gentlemen were elected to serve as *trustees for three years*, viz.: Messrs. Alonzo Robbins, E. M. Boring, William McIntyre; and a *committee on deceased members*, consisting of three members, was also elected to serve for *one year*, as follows: Messrs. Charles Bullock, Joseph P. Remington, Alfred B. Taylor.

Colleges of Pharmacy.—The courses of lectures have begun last month, and as far as we have learned there is a goodly attendance at all pharmaceutical colleges.

In the *Philadelphia College of Pharmacy* it was found necessary to increase the number of working tables in the chemical laboratory from 32 to 48; Fred. B. Power, Ph.G., a graduate of the class 1873—74, and lately of the University of Strassburg, has taken the position of assistant to the superintendent of the laboratory.

In the *New York College of Pharmacy* the museum has, through the liberality of Mr. A. C. Dung, been enriched with a valuable collection of cinchona barks, formerly in the cabinet of Dr. Martiny of Darmstadt. The library has also received several valuable additions.

Physicians and Pharmacists in Council.—An adjourned meeting of physicians and pharmacists was held at the Philadelphia College of Pharmacy, October 1, Dr. Stubbs in the chair, and Dr. Stretch acting as secretary. The subject of discussion was the *renewal of prescriptions*. In the lengthy discussion we fail to find any new argument. On the one side it was contended that the physician charges a professional fee, but does not sell the prescription; that serious results, and even death, had taken place in consequence of unauthorized renewals, and finally, as stated by Dr. Butcher, that in consequence of pecuniary losses to physicians they object to the miscellaneous renewals of their prescriptions. On the other hand it was held, that pharmacists cannot stop the public from the privilege of having prescriptions

renewed, but that the physician should educate the patient up to the point that it is unsafe to take medicine without the physician's orders.

On motion of Mr. Blair, amended by Dr. Butcher, it was

Resolved, That physicians, when writing a prescription which they do not wish renewed, should *write* on the bottom of such prescription "Do not renew," and also inform the patient of the fact in every case; and on the other hand, the drug gist should either *write or print* on the label upon the bottle or package "Not to be renewed unless by a written order of the doctor."

We are glad that this plan has been agreed upon; but whether it will work the desired reform we are inclined to doubt. By long usage the patient has a right to a copy of the prescription, and if he demands it, even to the original. This was alluded to in the discussion and an amendment was offered "that no copy be furnished," but was afterwards withdrawn. However, even if it had been adopted, there is nothing to prevent the patient from taking a copy of the prescription, instead of the original, to the drug store. That the subject is not easily settled by passing resolutions was felt by some of the speakers who suggested its settlement by a suit in equity or by legislative enactment.

The adoption of a "medical and pharmaceutical code for mutual observance by which the legitimate province of pharmacy and the professional rights of physicians shall be secured" was repeatedly alluded to, and Dr. Prall thought that this would overcome the difficulties, and that then druggists could always discourage renewals as a duty, especially when the ingredients were injurious to be taken for any length of time. We submit that there is a vast difference between *discouraging* and *refusing* renewals, and that in the cases cited conscientious pharmacists regard it as their duty to caution the patients against the injury likely to result from the continued use of dangerous drugs.

At the adjourned meeting, held October 8, the subject of discussion was *counter prescribing*. Besides the difficulty of exactly defining what is meant by "prescribing over the counter," and how far the pharmacist is justified in expressing an opinion as to the choice of simple remedies, the discussion did not bring forth any new points. On the part of the physicians charges were made, while the pharmacists present denied the same applying to them; evidently the advice in our last issue, not to burden on either profession the misdoings of some of its members, was not heeded. Attention was called to the code of ethics of the Philadelphia College of Pharmacy, and on motion of Professor Remington the following resolution was adopted:

Resolved, That as the diagnosis and treatment of disease belong to the province of a distinct profession, and as a pharmaceutical education does not qualify the pharmacist for these responsible offices, he should, where it is practicable, refer applicants for medical aid to a regular physician.

The Philadelphia pharmacy law was then alluded to, and it was stated that, if faithfully carried out, it would prevent the sale of drugs and poisons by incompetent men. The hope was expressed that the time might not be far off when it would be settled for the public who are competent physicians; a bill to that end would be presented to the next legislature.

Motions were made and carried requesting the editor of the "American Journal of Pharmacy" to publish a brief report of these meetings; thanking Professor Reming-

ton for his kindness evinced during the discussions, and thanking Dr. Stretch for his faithful services as Secretary.

Although we do not believe that the questions discussed have been settled to the satisfaction of *all* interested, yet we do believe that much good would come from a more frequent intercourse of physicians and pharmacists. It need not be grievances or criminations to bring them together; there are so many scientific and practical points on which the members of one profession might enlighten the other, that we feel sure such meetings might also be made interesting to the attendants.

A Bogus Medical Institution.—On page 235 of our April number a list of so-called colleges and universities has been published whose diplomas have been issued for a money consideration, and without requiring the tedious course of acquiring knowledge through systematic instruction. To this list must now be added the "Washington Medical Institute," incorporated under an act of Congress passed in 1870, which provides that any three or more persons of full age, citizens of the United States, a majority of whom shall be citizens of the District of Columbia, who desire to associate themselves for benevolent, charitable, educational, literary, musical, scientific, religious or missionary purposes, may make, sign and acknowledge before any officer authorized to take acknowledgement of deeds in the District, and file in the office of the Recorder of Deeds a certificate setting forth the objects for which the society is formed, and the name or title by which such society shall be known in law, as well as the particular business it purposes to transact. Upon filing their certificate, the persons shall be a body politic and corporate, and they and their successors may have and use a common seal, and may alter and change the same at pleasure, and may make by-laws and elect officers and agents.

The New York "Herald" of October 23d gives a history of the concern referred to, which commenced with the filing, at the City Hall, Washington, D.C., on Nov. 16, 1874, of the following articles of incorporation, duly acknowledged on the day mentioned before Chas. Con. Callan, Notary Public. The document is worded as follows:

Be it known that under and by virtue of the provisions of Section 3 of an act of Congress approved May 5, 1870, entitled "An act to provide for the creation of corporations in the District of Columbia by general law," the undersigned citizens of the United States have constituted themselves a body corporate under the name and title of "The Washington Medical Institute of the District of Columbia," whose object and purpose is to provide the public protection against medical charlatany in every form; to disseminate knowledge throughout the United States by a series of lectures, both public and private, and to provide for the treatment of all diseases. The trustees, to whom shall be confided the management of the affairs of said institute, shall be four in number, and shall consist of John E. Smith, M.D.; Seldon W. Crow, M.D.; Oscar C. Stout, M.D., and B. Brown Williams, M.D., from whom the officers of such institute shall be elected for the first year of the existence of said institute.

JOHN E. SMITH, M.D.,
SELDON W. CROW, M.D.,
OSCAR C. STOUT, M.D.,
B. B. WILLIAMS, M.D., *et al.*

It will be observed that no authority is claimed for conferring degrees, nor could

such be done under the law cited above, by which medical colleges are held to be institutions of learning, and as such the incorporators are responsible to the authorities of the district, and are empowered to confer degrees, and are annually required to file with the Recorder of Deeds a statement of the trustees and officers of the institution. But the fact of being legally incorporated would seem to be quite sufficient for assuming the responsibility of issuing diplomas.

The name of neither of the four corporators appears on the list of medical practitioners of Washington, and only Smith and Crow seem to have resided there for some time; the latter claims to be a graduate of the Jefferson Medical College of Philadelphia and of the National Medical College of Washington. The building No. 215 Twelfth st., southwest, where this institute claimed to be located in 1875, is at the present time a tenement house.

The New York "Herald" publishes also a letter addressed to a New York physician, offering to the latter a diploma for \$25; but it is likely that in most cases the "Institute" offered its sheepskins to quacks and to those whom the "Dean" supposed to be quacks. We have heard of two other cases precisely analogous to the following.

On August 29, the following printed postal card was mailed in New York:

TAKE NOTICE.

By Act of Legislature, State of New York, Sec. 2, You Dr. R. . . . are required to Register in the County Clerk's Office, City Hall, New York City, your Name, Residence and Place of Birth, with your authority for Practising Medicine, Surgery, Mid-wifery or any branch thereof by Electricity, Magnetism or otherwise, before the First day of October, 1880, under penalty of fine and imprisonment. No further Notice will be given.

By order of the Association for the Suppression of Quackery.

The postal card was addressed to a member (not a physician) of a respectable mercantile firm who have been advertising a beverage under the name of orange tonica, which doubtless attracted the attention of the enterprising "Institute," and the above card was merely sent as a precursor to a subsequent offer. There is no society, having the above title, in New York, and the handwriting of the address and name in the card, though disguised, evidently resembles the handwriting in a letter which was likewise addressed to "Dr. R. . . .," and was mailed in Washington, D. C., on the morning of September 18. The following is a copy of the letter, the italicized heading being printed in the original:

Washington Medical Institute.
Incorporated November 16, 1874.
Act of Congress May 5, 1870

Post Office Box 221.

Washington, D. C., September 17, 1880.

Doctor:—Should you desire to procure a diploma which will enable you to practice in any part of the world, you can procure one for \$25 from the Washington Medical Institute. If you wish one send name, age, address and number of years in business and the Dean of the faculty will call upon you and examine you and confer degrees as provided by Act of Congress.

Address Washington Medical Institute,
P. O. Box 221, Washington City, D. C.

Further comment is unnecessary. That the charter of that "Institute" is legally forfeited there can be no doubt, and it is to be hoped that the proper authorities so

declare it. But whether Dr. Crow, who seems to be the leading man in this concern, and his co-partners are not also criminally liable for using the U. S. mail for fraudulent purposes, is a question well worthy the consideration of the Postmaster General.

Correction.—On page 517 the figures, to which attention was called by a foot-note, should be changed from 48 to 24 *troyounces of sugar*.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Qualitative Chemical Analysis. By Silas H. Douglas, M.A., M. D., and by Albert B. Prescott, M.D., F.C.S. Third edition, wholly revised. New York: D. Van Nostrand, 1880. 8vo, pp. 305.

The work is intended as a guide in the practical study of chemistry and in the work of analysis, and occupies a prominent place among works of similar aim for thoroughness and reliability. After an introductory chapter on notation, atomic weights and general advisory remarks on analysis, Part I treats of the metals in four groups, Part II of the non-metals and the acids, and Part III on systematic examinations. A very interesting and valuable addition is the chapter (Part IV) on a study of oxidation and reduction. The concluding pages are occupied by tables of solubilities and of reagents, and by a very full index. The work well deserves the attention of teachers and students of analytical chemistry.

Grundlagen zur Beurtheilung des Trinkwassers, zugleich mit Berücksichtigung der Brauchbarkeit für gewerbliche Zwecke und der Reinigung von Abfallwasser, nebst Anleitung zur Prüfung des Wassers. Von Dr. E. Reichardt, Professor in Jena. Halle. Buchhandlung des Waisenhauses, 1880. 8vo, pp. 170.

Principles for the valuation of drink-water, also in regard to the fitness for industrial purposes and the purification of waste-water, with a guide to the examination of water.

The title indicates the aim and object of the book before us. The fact that the publication of a fourth edition has been rendered necessary is a sign that it has been found useful and is appreciated. The science of public health is continually attracting more attention. Water is a necessary agent for the existence of man and of other organized beings, and the preservation of man's health depends to a very considerable extent upon the purity of the water consumed by drinking, in cooking, etc. That sewage and other contaminations of water are apt to produce serious epidemics cannot be denied, as the experience of certain sections of our own country abundantly proves. It is, therefore, a matter for congratulation that the examination of water has received much attention during the past years.

The work before us is based upon a large number of investigations, undertaken with the view of determining the fitness of various waters for the use of man. It offers numerous suggestions and discusses all kinds of conditions, which have of late years attracted attention as bearing upon this important question, and since the

author has critically sifted the various methods proposed, it will be found a reliable guide for the purposes indicated in the title. The addition of thirty-three good wood cuts and of two lithographic plates of various diatomaceæ enhances the usefulness of the work for the object intended.

American Newspaper Directory, containing accurate lists of all the lists and periodicals published in the United States, Territories and the Dominion of Canada, together with a description of the towns and cities in which they are published. New York: Geo. P. Rowell & Co., 1880. 8vo.

The twelfth annual issue of this directory now before us is perhaps even more elaborate than those of its predecessors which we have seen and favorably commented upon heretofore. We believe it to contain the best and most reliable collection of facts concerning the periodicals of North America. It is a volume of over 1,000 pages, one half of which is occupied by the directory proper.

Brief Longhand. By Andrew J. Graham. New York (Bible House). Pp. 84. Price, bound, 63 cents.

The long title of this little book states that it contains a system of longhand contractions, by means of which the principal advantages of shorthand are secured without resort to stenographic characters and with perfect legibility. It is methodically arranged and is furnished with ample illustrations, and with keys to the exercises, and contains also, remarks upon the means of acquiring ease and correctness in composition, directions for correcting the press, for keeping a common-place book and index rerum, etc. The system of brief longhand recommended cannot fail but be useful and time-saving to those who are in the habit of taking notes and making memoranda, and as it is easily acquired and read without difficulty, commends itself favorably to all, the more so since after it has been mastered it may be very readily used in combination with phonographic signs.

The Art of Prolonging Life. By Christopher William Hufeland. Edited by Erasmus Wilson, M.D. Philadelphia: Lindsay & Blakiston. 12mo, pp. 298. Price \$1.

Most of our readers have probably heard of this work which is known also under the title of "Macrobiotic," and was published by Hufeland nearly a hundred years ago. It has been translated into most modern languages, and since the advice on diet and general hygiene has deservedly gained for it great popularity, this new edition, which is essentially the English translation first published in 1797, will doubtless be read here by many who appreciate the value of sound health.

Handbuch der Botanik. Von Prof. Dr. N. J. C. Müller. I Band: Allgemeine Botanik. I Theil: Anatomie und Physiologie der Gewächse. Heidelberg: Carl Winter's Universitätsbuchhandlung, 1880. 8vo, pp. 648.

Handbook of Botany. Vol. I, General Botany. Part I, Anatomy and Physiology of Plants.

The author, who is Professor of Botany at the Academy of Forestry at Mün-

den, presents here the first part of a work which, if continued and finished with the same care that has been bestowed upon this book, will be a very important and most valuable one, inasmuch as it aims to give not merely the facts as ascertained by indefatigable investigators, but furnishes, likewise, the proofs together with the methods followed for investigation. The microscope and polariscope are most valuable agents for discerning the structure and observing the histological and chemical changes in plant-life; but certain effects and processes are demonstrable also by physical experiments, and these, as a rule, are very clearly described and where necessary illustrated.

The work is divided into ten chapters, treating of protoplasm, cell formation, phenomena of growth of the membrane, growth of membranes and elongation of organs, results of growth of membranes, causes of changes in direction and position, coarse anatomy, theory of the nutrition of plants, influence of heat and retrograde decompositions, including disease, fermentation, decay and putrefaction. The subjects are very fully illustrated by nearly 500 good wood cuts, a number of which have been printed in several colors. The botanist desiring to familiarize himself with the scientific investigations on plant life under the most varying conditions will find this a very excellent work instructive as well as suggestive of further experimentation.

Das Protoplasma als Träger der pflanzlichen und thierischen Lebensverrichtungen.
Von Dr. Joh. von Hanstein. Heidelberg: Carl Winter's Universitätsbuchhandlung, 1880. Pp. 188.

Protoplasm as the sustainer of the vegetable and animal vital functions.

The author, recently deceased, was Professor of Botany at the University of Bonn and well known for his numerous scientific investigations in the various branches of botany. The work before us has for its object the sifting of facts and observations in regard to the sources of the vital force peculiar to the living beings and discusses, first, the development and activity of the minute elementary parts of all organisms, the cells, which must be regarded as the seat of vital activity. The second part is devoted to the origin of protoplasm and its functions in the living cell, and it is shown that the cell and protoplasm together are necessary to produce any and all manifestations of life in the most simple individuals of protococcus and allied beings as well as in the most perfect ones known. The diction of the essay is clear and entertaining, so that the subjects discussed are readily comprehended also by others than professional botanists.

Forschungen auf dem Gebiete der Agriculturphysik. Herausgegeben von Dr. E. Wollny. Heidelberg: Carl Winter's Universitätsbuchhandlung. Vol. I, II.

Researches in the domain of agricultural physics.

It is well known that the proper development of plants depends mainly upon the physical conditions of the soil and atmosphere, and these viewed in their relation and influence upon cultivated plants, as well as the physical conditions of the plants themselves, have been embraced under the term, "agricultural physics." The periodical, the two first volumes of which, published in 1878 and 1879, are now before

us, is devoted to the discussion of all subjects relating to the cultivation of plants and based upon exact experiments and observations. It is obvious that such a journal, properly conducted, would supply a want, and it appears to us that the editor, who is professor of agriculture in Munich, has very judiciously labored in the direction indicated, not only by the publication of original papers, but likewise by reviewing works and essays published elsewhere and falling within the scope of the "Researches." Our space will not permit to give the titles of even the most important papers, but we may state that among others researches have been published on the carbonic acid present in the air and soil of forests; on the absorption of water by plants; on the absorption and emission of heat by the soil; on germination; on the temperature of dense and loose soils; on the consumption of water by forest trees, etc., etc.

Die Naturgeschichte des Cajus Plinius Secundus. Ins Deutsche übersetzt und mit Anmerkungen versehen von Prof. Dr. G. C. Wittstein. Leipzig: Gressner & Schramm, 1880. Price, per part, 2 marks.

The natural history of Cajus Plinius Secundus. Translated into German, with the addition of notes. By Prof. Dr. G. C. Wittstein.

The work of the elder Pliny has been translated into most European languages, an attention which it deserved already on account of the great variety of subjects comprehended by it, and because of its influence exerted upon the views held during the middle ages. The excellent translation by Prof. Wittstein, of which we have received one part, is accompanied by critical and historical notes which will be valued by most readers. The work is to be published in about 12 parts, each containing 160 pages.

A Manual of Minor Surgery and Bandaging. By Christopher Heath, F.R.C.S., Surgeon to University College and Holme Professor of Clinical Surgery in University College, London, etc. 6th Edition. Revised and enlarged, with 115 illustrations. Philadelphia: Lindsay & Blakiston, 1880. Pp. 342. Price \$2.

This work is not intended for the pharmacist, but was written with the primary object in view to offer to young surgeons, holding the responsible post of house-surgeon in hospitals and dispensaries, some hints in the treatment of the numerous accidents and emergencies daily coming under their care. The illustrations of apparatus, instruments and operations are like the text, clear and instructive, and will be found well adapted for the wants of the student in surgery. The book contains also, 61 formulas selected from the pharmacopœias of the various London hospitals.

A New School Physiology. By Richard J. Dunglison, A.M., M.D. Philadelphia: Porter & Coates. Pp. 314.

We believe that this work is well calculated to fulfill its object of imparting to the young a knowledge of the general structure of the body so as to enable them to be watchful in regard to the laws of health, which must naturally be studied in connection with physiology. The concise descriptions, shorn of many of the technical terms; the frequent comparisons with the anatomy and physiology of other animals

and the large number (117) of good cuts in illustration of the subjects discussed, render the work quite acceptable for schools. In his references to vegetables, the author has in some cases not been as precise as might be desired. When, on page 14, it is stated that, "as a general rule, vegetables contain more solids than fluids," this may be accepted, perhaps, for the large majority of strictly woody plants, but certainly not for the herbs, many of which are known to yield only from 10 to 20 per cent. of *air-dry* material. On page 15, it is said that the food of vegetables "is ready for use, and it is at once absorbed," while the food of animals requires to be taken into the stomach and digested or prepared for absorption. On page 49, the food of plants is said to be mainly water, carbonic acid, ammonia, etc. These undoubtedly have to undergo "the process by which food becomes converted to the needs of the system," *i. e.*, digestion, though in plants it is probably more correctly called assimilation. It may be "very simple," as the author tells us, but the precise manner in which the plant converts inorganic into organic compounds is still unknown.

Hygienic and Sanative Measures for Chronic Catarrhal Inflammation of the Nose, Throat and Ears. Part I. By Thos. F. Rumbold, M.D. St. Louis: Geo. O. Rumbold & Co. 1880. 12mo, pp. 174.

This work is the result of observations extending over twenty years, and showing that the successful management of catarrhal affections depend upon the faithful observance of the laws of health, and that the continued observance of proper hygienic rules are essential for the maintenance of health. The first eleven chapters on Hygienic Measures discuss the protection of the various parts of the body by proper clothing; the exposure to draughts, night air, etc.; the temperature and ventilation of the bed room; diet and stimulants; exercise and disposition of the mind. Among the sanative measures which follow, are discussed the cleansing of the nasal and pharyngo-nasal passages; the removal of hardened secretions from the nasal passages; the cleansing of the ears, the teeth; bathing and the application of oil to the body, and a lengthy chapter is devoted to tobacco and its mental and physical effects, showing that its use predisposes to catarrhal diseases. For inunction the author formerly used bland fixed oils, but these became exceedingly offensive on the body, and the author now recommends in their place the use of vaselin, under which name he evidently includes the soft paraffins, sold under various names. If, as is stated in the quotation from an essay by Dr. James Y. Simpson, the use of the oil is followed by absorption and assimilation, it is evident that the soft paraffin, owing to its different constitution, must act in a different manner, though it may produce the same result.

The book is written in such a plain but not common-place language, and with such evident sincerity, that we heartily recommend it to intelligent readers generally, believing that its perusal will lead to the adoption of measures calculated to prevent the "catching of cold."

Die Pseudomorphosen des Mineralreichs. Vierter Nachtrag. Von Dr. J. Reinhard Blum. Heidelberg: Carl Winter's Universitäts-Buchhandlung, 1879. 8vo, pp. 212.

The Pseudomorphs of the Mineral Kingdom. Fourth supplement.

Thirty-six years ago the author published his first work on the pseudomorphs, in

which altogether 164 kinds were described. So effectual has been the research in this direction that the author has now been able to describe 254 pseudomorphs by transformation and 182 such by displacement. The study of these products is of particular interest and importance in the researches on the changes which have taken place and are continually occurring in the rocks of our globe, and the work before us is perhaps the most efficient aid in such researches, since it contains all the observations on this subject which were known at the time of publication.

On the Development of Lemna minor. By Wm. Barbeck.

From the Proceedings of the Academy of Natural Sciences of Philadelphia, accompanied with a lithographic plate showing the different stages of development.

Das Verhalten des Schimmelgenus Mucor zu Antiseptics und einigen verwandten Stoffen mit besonderer Berücksichtigung seines Verhaltens in zuckerhaltigen Flüssigkeiten. Dorpat. 1880. Pp. 50.

The behavior of the mold genus *Mucor* to antiseptics and several allied compounds, with particular regard to its behavior in saccharine liquids.

The effectiveness in preventing the growth of mould was found to be greatest in corrosive sublimate and iodine, one part of each being sufficient to protect 50,000 parts of liquid. Then followed chlorine, volatile oil of mustard, thymol (1 in 10,000), sulphurous acid, bromine, potassium xanthogenate, sodium benzoate, oil of cinnamon, crude 30 per cent. carbolic acid (1 in 4,000), chlorinated lime, beechwood tar creasot (1 : 1,800), benzoic acid (1 : 1,250), carbolic acid and cresylic acid (1 : 1,000), salicylic acid (1 : 500), soda, picric acid, oil of eucalyptus (1 : 250), etc.

No preventative influence was exerted by potassium permanganate (1 : 500), aluminium acetate, chloral hydrate (1 : 70), quinia muriate, sodium carbonate (1 : 50), potassium chlorate, copper sulphate, chromic acid (1 : 5), sodium chloride, potassium nitrate and glycerin, the last three in the proportion of 1 : 4. Neither had alum any effect.

Zur Geschichte des Chinidins und Cinchonidins, und Normirung der Nomenclatur dieser Chinaalkaloide durch den chinologischen Congress in Amsterdam (April 13, 1877). By Dr. G. Kerner. Halle, 1880.

Notes on the history of quinia and cinchonidia, and on the nomenclature of these cinchona alkaloids by the quinological Congress at Amsterdam.

The author defends the nomenclature referred to, which is the one commonly used in the United States, and opposes the introduction of Hesse's designation cinchinia for quinia. The pamphlet is a reprint from "Archiv der Pharmacie."

Kritische Beurtheilung der Methoden, welche zur Trennung und quantitativen Bestimmung der verschiedenen Chinaalkaloide benutzt werden. By Carl Hielbig. Dorpat, 1880. Pp. 86.

Critical examination of the methods for the separation and quantitative determination of the different cinchona alkaloids.

The author has carefully examined the analytical methods proposed by De Vrij,

Moens, Guillermond, Carles, Stoeder, Cleaver and others, and proposes a process for the valuation of cinchona bark, based upon that recommended by De Vrij, and of which the following is an outline: 2 grams of the mixed alkaloids are dissolved as acetates in 30 cc. of water and the solution mixed with 1 gram of Rochelle salt and well stirred. The precipitate contains quinia and cinchonidia tartrates, which are dissolved in 20 parts of 90 per cent. alcohol acidulated with 1.6 per cent. sulphuric acid; in this solution the quinia is estimated by iodosulphate of chinoidin, and the cinchonidia by the difference of the weights of the mixed tartrates and of the quinia tartrate. The filtrate from the precipitated tartrates yields with sodium iodide a precipitate of quinidia hydriodate, and from the filtrate the remaining alkaloids are recovered by soda, dried and exhausted by absolute ether, which dissolves the amorphous alkaloid with small quantities of quinia. The insoluble portion is washed with water to remove soda, and the residue weighed as cinchonina. In the details, given by the author the alkaloidal compounds remaining dissolved in the mother-liquors and wash-waters are likewise estimated.

Vergleichende Untersuchung einiger indischen Handelsorten des arabischen Gummi, und der wichtigsten Handelsorten des Traganth und seiner Surrogate. By Emil Masing. Dorpat.

Comparative examination of several East Indian varieties of gum-arabic, and of the most important commercial varieties of tragacanth and its substitutes.

The two essays are reprinted from "Archiv der Pharmacie." The author has determined for the gums: Moisture, solubility in water, ash, HCl required for neutralizing ash, and the behavior of the gum solution to potassium silicate, potassium stannate, neutral and basic lead acetate, neutral copper acetate and ferric chloride. The tragacanth was examined for moisture, ash, HCl for neutralizing the ash, amount perfectly soluble in water on treating .5 gram with 100 cc. of water, and volume of sediment deposited in this solution after standing for two days.

Versuche über die Wirkung des Pepsins auf einige animalische und vegetabilische Nahrungsmittel. Von Friedrich Kessler. Dorpat, 1880. Pp. 48.

Experiments on the effect of pepsin upon various animal and vegetable victuals.

A large number of experiments made for the purpose of determining the comparative digestibility of numerous substances in the raw state and variously prepared.

Beiträge zur Kenntniss der Aloe. Von Carl Treumann. Dorpat, 1880. Pp. 78.

Contributions to our knowledge of aloes.

From these investigation we mention the composition of the various aloins as determined by the author: Barbaloin $C_{48}H_{55}O_{20}$, Capaloin $C_{46}H_{56}O_{20}$, Socaloin $C_{45}H_{52}O_{20}$, Nataloin $C_{45}H_{55}O_{20}$ and Curaçaoaloin $C_{44}H_{50}O_{20}$. The purgative properties of aloes are due to aloin as well as to its oxidation products; the latter being the less active, the more they differ from the former. While nataloin is without medicinal value, the doses of the other aloins are as follows: Capaloin, .12 to .16 gram; barbaloin, .15 to .2 gram; socaloin, .2 to .25 gram and Curaçaoaloin .25 to .3 gram.

Vergleichende Untersuchungen einiger Catechu- und Gambir-Proben, nebst kritischer Beleuchtung der Methoden zur Bestimmung ihres Handelswerthes. Von Adolf Lehmann. Dorpat, 1880. Pp. 66.

Comparative examination of several specimens of catechu and gambir, with critical observations on the methods for determining their comparative value.

From his numerous experiments the author regards the analytical method proposed by Günther in 1870, though not yielding absolutely correct results, at least as serviceable for approximately determining the value of catechu and gambir. In the aqueous solution the catechin and catechutannin are estimated together by Loewenthal's method by titration with potassium permanganate; afterwards the tannin is estimated alone by Schulze's method by precipitation with gelatin in the presence of sal ammoniac, and the catechin is found by subtracting the tannin from the mixed tannin and catechin. The weight of the latter is found somewhat higher on account of the presence of other soluble organic principles, and a source of error is found in the difficulty of oxydizing the solutions of different samples to the same tint of color.

Beiträge zum forensisch-chemischen Nachweise von Blut aus Flüssigkeiten, Harn, Zeug und Erden. Von Victor Schwarz, M.D. St. Petersburg, 1880. Pp. 27.

Contributions to the forensic-chemical determination of blood from liquids, urine, fabrics and earths.

Reprint from the Pharmaceutical Journal of Russia. The essay is not adapted for a brief abstract, but we may mention that the author regards the preparation of hæmincrystals, as recommended by Teichmann, and the spectroscopical examination, as furnishing conclusive evidence of the presence of blood. A solution of borax was found to be very serviceable for dissolving the blood from fabrics, sand and different earths, and after precipitating the solution with zinc acetate, for obtaining hæmincrystals from the precipitate.

The therapeutic value of the iodide of ethyl. By Robert M. Lawrence, M.D. Boston.

The Problems of Insanity. A paper read before the New York Medico-legal Society March 3, 1880. By George M. Beard, A.M., M.D.

National Association for the Protection of the Insane and for the Prevention of Insanity. Boston, 1880.

An account of the organization of this society.

Proceedings of the adjourned meeting of the Convention of Agricultural Chemists, held at Boston, Mass., Aug. 27, 1880. Raleigh, N. C., 1880.

OBITUARY.

ELWOOD GOULDY HENDRICKS, a graduate of the Philadelphia College of Pharmacy, class 1878, died of consumption August 30th last. He was born July 2d, 1857, in Centre Point, Montgomery county, Pa., and was apprenticed to Mr. Wm. K. Mattern of this city.

THE AMERICAN JOURNAL OF PHARMACY.

DECEMBER, 1880.

SOLUBLE COMPRESSED PELLETS for HYPODERMIC MEDICATION.

BY L. WOLFF, M. D.

Read at the Pharmaceutical Meeting, Nov. 16th.

With the introduction of hypodermic medication as a permanent feature in therapeutics a demand was made on the pharmacist to prepare the proper remedies required for this use in suitable form. The principal agents thus required were the salts of morphia, and to have them in a most concentrated form, the solution of Magendie, containing two grains of the morphia salt to each drachm of water, was usually dispensed.

It was soon found, however, that this was too bulky to carry in the quantities that might be required, and besides that it would not keep well, being subject to decomposition at the expense of the morphia salt, by the formation of *confervæ*, which, like fungi, are apt to create irritation of the skin and abscesses, often of a serious nature. The addition of such antiseptics as glycerin, carbolic acid and chloral hydrate, though obviating this difficulty, increases the burning pain accompanying the injection, in such a degree as to render these admixtures certainly undesirable.

To avoid all of these defects practitioners soon got into the habit of carrying powders containing usually a quarter grain of morphia sulphate each, to which is often admixed a minute quantity of atropia, to correct the unpleasant effects of the morphia and to increase its anæsthetic properties, which powders are then dissolved in a syringeful of water when needed.

But even the morphia powders prove inconvenient, for various reasons. As usually one quarter grain cannot be accurately weighed on the pharmacist's dispensing scales, they are rarely so evenly divided as desirable for the purpose, besides they are also too bulky to carry in

quantities, and not always, at the pressure of the moment to relieve pain, well or easily removed from the paper in which they are contained, even if they should not have been previously partly spilled in the pocket or pocket-case of the physician. The morphia salt in this form is also subject to the action of atmospheric moisture or the warmth of the body, and forms as a consequence a concrete mass not easily dissolved, if not actually deteriorated.

Impressed by these objections, my attention was recently called by my friend Dr. H. Augustus Wilson to the advisability of making the powders into small pills, which I accomplished by an admixture of an equal quantity of white sugar and a little water.

These granules so prepared, however, were not readily soluble; the sugar, besides, increased the burning sensation already experienced in subcutaneous injections.

With a view of increasing the solvent action of the water on the surface of the powder, I had constructed a small pill press on the plan suggested and described by Prof. Remington ("Amer. Jour. Pharm.," March, 1876, page 97), and with it overcame the mechanical obstacle, while we were soon led to substitute sodium chloride for the sugar as a disintegrator (properly so styled by Dr. Wilson in his paper recently read on this subject before the "Philadelphia County Medical Society"), which in dilute solutions is painless and devoid of irritant action when applied to mucous surfaces, forming as it does a principal ingredient of the liquids of the organism.

As morphia sulphate, however, seemed to dissolve badly and tardily in a solution of sodium chloride, we adopted in its place the hydrochlorate of that alkaloid, already suggested by Trousseau for hypodermic injections, and recommended by English authors, amongst whom "Christison" gave it the preference, because he attributed to it a more constant action, unaccompanied by unpleasant symptoms.

With these, and by means of the pill press, we obtained pellets forming rapidly clear solutions in a little water, while by the presence of the sodium chloride the burning pain of the injection seemed to be considerably diminished, and its absorption, probably due to the crystalloid nature of the salt and its superior diffusibility, seemed to be promoted. (Pellets here exhibited.)

The full effect of a hypodermic injection of morphia is usually experienced in from 12 to 15 minutes, whereas by the use of these

pellets both Dr. Wilson and myself have noted it to take place in from 4 to 10 minutes.

The pellets can be easily made by any pharmacist having the necessary pill press, but should not be compressed with too much force (a tap with a light wooden mallet usually suffices), else the solutions will not be rapidly enough obtained.

When used, they should be first moistened with one drop of water out of the filled syringe, then broken up with the blunt point of the syringe, all the water added, then sucked up and forced out of the syringe two or three times, until the solution is complete, which we have frequently succeeded doing in 22 seconds.

I would enumerate the advantages of these pellets as follows :

1. They occupy the smallest possible space.
2. They can be carried without paper (I usually dispense them in a glass tube, about one inch in length, closed on both ends by small corks)
3. They are always accurate; containing one quarter grain of sodium chloride, besides the medicinal agent; their weight is at least half a grain, which can be readily weighed out; for the same reasons, the possible inaccuracy in weights or weighing is reduced to one-half.
4. The morphia salts, by the presence of sodium chloride, possessing antiseptic properties, can be preserved for an indefinite period.
5. Their solutions give less pain than the ordinary solutions of either morphia salts alone or with their antiseptic admixtures.
6. They can be kept on hand ready made, and therefore dispensed at a smaller cost than the powders.

There is no reason why this form for hypodermic remedies may not be extended to other remedial substances, and as salt is already suggested as an addition to mercuric bichloride for that purpose, this might certainly be so prepared, as well as apomorphia, pilocarpia hydrochlorate, strychnia hydrochlorate, and other remedial agents subcutaneously administered in minute quantities.

Philadelphia, November, 1880.

THE PREPARATION OF SYRUPS BY PERCOLATION.

BY SAMUEL W. GADD, PH.G.

From an Inaugural Essay.

The author is in favor of preparing most syrups by the cold process, and describes the operation as follows:

Take a funnel, for ordinary operations of the capacity of about five pints, the angle of which is about fifty-five degrees, and having a wide throat. Insert a small piece of sponge loosely in the throat of the funnel, to prevent the particles of sugar from passing through. Add the sugar, pour over it the requisite amount or a portion of the menstruum, insert a stopper in the mouth of the funnel and set aside for a short time; then, removing the stopper, return for re-percolation the portion of liquid which immediately flows; that following will be a saturated solution. In my experiments I learned that a funnel having the specified angle is much better than a cylindrical percolator, or a funnel having a greater angle. For in a cylindrical percolator, the column of sugar being so tall, the portion of liquid at the upper part becomes saturated, and will occupy too much time in passing through. If, on the other hand, a funnel having a greater angle be used, the liquid in its downward passage will continuously cause the bulk of sugar to depress in the centre until it reaches the stopping in the throat of the funnel, when the remaining portion of liquid will pass through unsaturated, and leave a portion of sugar on the sides of the funnel. This difficulty does not occur if a funnel be used having nearly the specified angle, but the sugar sinks uniformly as the liquid passes out, the menstruum thus taking up all the sugar, and passing out as a saturated syrup. If it be required to make a considerable quantity of syrup, as the sugar in the funnel sinks fresh portions of sugar and menstruum may be added alternately, without having been previously weighed or measured; only care is necessary not to add more menstruum than the sugar requires, and the amount will be readily ascertained by one who has performed the process but once or twice. The result will be precisely the same as if the sugar were weighed and the menstruum measured out, and the flow will be continuous as long as the additions are made. Simple syrup thus obtained near the temperature of 60°F. indicated a specific gravity of 1.324 at 69°F. This is slightly above that of the officinal syrup, which is 1.317. However, if that specific gravity be desired, it may readily be obtained by adding 13.65 cubic

centimeters of water to each liter, or 14 fluidrachms to each gallon of syrup. But for all practical purposes this is unnecessary, as the syrup will keep better if not diluted. Thus obtained it is similar in all respects to that obtained by the officinal process, but is free from the steam-like odor which may often be noticed in that obtained by heat, and also has a clearer and more glittering appearance.

The medicated syrups which I first prepared in this way were the syrups of ginger and of tolu. These were readily obtained, and many of the officinal syrups were successfully made in like manner. The syrup of orange flowers is exceedingly delicate and fragrant prepared in this way, more so than obtained as directed by the Pharmacopœia, as the heat there employed drives off a portion of the volatile odorous principles.

For the syrup of ipecacuanha I have adopted the following formula : Take of fluid extract of ipecacuanha f̄3ii ; add to it f̄3vi of water ; put it in a vial, cork and shake it ; then let it stand for a day, in order that the apotheme may be precipitated. Pour the liquid upon a filter, and add sufficient water through the filter to make the filtered liquid measure f̄3xii. Then take of granulated sugar ̄3xxi ; place in a funnel as previously directed and percolate with the liquid obtained. To the percolated syrup add sufficient simple syrup to bring the measure up to two pints, and mix well by agitation. The result is a syrup having the same strength as that directed by the Pharmacopœia, free from any flocculent precipitate and lighter in color. Some writers have inferred that the apothemical matter precipitated in this manner contains a portion of the emetia, which is the active principle of ipecacuanha. In order to ascertain if such were the case I took the amount of precipitate resulting from one fluidounce of fluid extract of ipecacuanha, but did not experience any uncomfortable result therefrom, thus showing the above assertion to be incorrect.

Syrup of wild cherry is expeditiously prepared by this process, not requiring as much labor nor consuming as much time as when prepared as directed by the Pharmacopœia.

Compound syrup of squill was also readily obtained by following nearly the directions of the Pharmacopœia, but differing in reserving a fluidounce of the water directed, dissolving the tartar emetic therein, adding it to the rest of the liquid, and percolating the sugar therewith as indicated.

Syrup of iodide of iron and syrup of acacia are the only official

syrops which it is not practicable to obtain by this process; the former would be decomposed by the continued exposure to the air, and in the latter case the solution of gum is too tenacious to percolate through the sugar.

With these exceptions, I believe all the officinal syrups, together with many others that are not officinal, may be prepared by cold percolation. The principal advantages of making syrups by this process are:

It is a saving of expense where the operator has to create a fire specially for that purpose.

It is a saving of time, as it does not require attention; for when the liquid has passed you know you have a saturated solution.

It is also a far more elegant and pleasant means of preparing them.

EXAMINATION of SOLUTION of CHLORIDE of IRON.

BY HOMER MCCOY.

Read at the Pharmaceutical Meeting, November 16th.

It has been suggested that the solution of chloride of iron is often very deficient in strength. A sample of this solution was obtained and the iron estimated volumetrically by a standard solution of permanganate of potassium, the process and results of which are here given:

The first step was to reduce the *ferric* chloride to *ferrous* form, which was accomplished by means of nascent hydrogen, evolved by the action of dilute sulphuric acid on metallic zinc in a closed apparatus, which excludes the air and prevents oxidation.

Commercial zinc contains a small proportion of iron, and the amount present in the zinc used was .024 per cent., which must be considered in accurate work. 3.061 grams of zinc were used in this estimation, and .024 per cent., or 0.000735 gram was iron, which must be deducted from the final result.

1.926 gram of the solution of ferric chloride was placed in the flask for generating the hydrogen—the apparatus closed and heat applied. When the zinc was all dissolved, the contents were cooled quickly, and then washed out into a beaker, about 300 cc. of distilled water added, care being taken that there be an excess of acid in the solution, and then quickly titrated with the standard solution of potassium permanganate until the last drop perceptibly colored the solution, showing oxida-

tion to be complete, when the reading on the burette showed 17.8 cc. of the standard solution to have been used. The strength of the solution of potassium permanganate had previously been estimated with pure iron wire, and 1 cc. of the solution oxidized 0.004936 gram of iron from *ferrous* to *ferric* form, or was equal to 0.004936 gram of iron; hence 17.8 cc. = 0.08786 gram of iron. Deducting 0.000735 gram, the amount of iron already present in the zinc used, we have left 0.0871 gram, the amount of iron in 1.926 gram of the solution of chloride of iron, or, expressed in percentage, 4.52 per cent.; and as 112, the molecular weight of iron, is to 325, the molecular weight of anhydrous ferric chloride, so is 4.52, the per cent. of iron found, to the per cent. of anhydrous ferric chloride, which is 13.1 per cent.

To find the per cent. of iron in the official solution, we quote the Pharmacopœia, which gives the following description and tests for liquor ferri chloridi:

"A reddish-brown liquid, having an acid and strongly styptic taste, and the specific gravity 1.355. Two fluidrachms of the solution, diluted with water and treated with ammonia in excess, yields a precipitate of sesquioxide of iron, which, when washed, dried and ignited, weighs 28.25 grains."

From these figures the percentage of iron and anhydrous ferric chloride is calculated as follows: As 160, the molecular weight of sesquioxide of iron, is to 112, the molecular weight of iron, so is 28.25, the number of grains of sesquioxide yielded by two fluidrachms of the solution to the number of grains of iron in two fluidrachms, which we find to be 19.775 grains. Also, two fluidrachms of the solution, having a specific gravity of 1.355, weighs 154.36 grains, and as just stated, contains 19.775 grain of iron, or, expressed in per cent., 12.8 per cent. Now, as the molecular weight of iron, 112, is to the molecular weight of anhydrous ferric chloride, 325, so is the percentage of iron in the official solution, 12.8, to the percentage of anhydrous ferric chloride, which is 37.1 per cent. Comparing these results, we have in the solution analyzed 4.52 per cent. of iron; in the official solution 12.8 per cent. iron, and 13.1 per cent. of anhydrous ferric chloride instead of 37.1 per cent. in the official solution, proving this solution to be very deficient in strength, which is also indicated by its light color.

Although, as will be seen by this method of estimation, the total amount of iron contained in the preparation was estimated, yet a portion

of the iron was also found to be present in the *ferrous* state, the exact amount of which was not determined. It is the intention to continue this investigation and to extend it to the examination of the tincture of ferric chloride.

MIXTURE FOR WRITING ON GLASS.

BY F. L. SLOCUM.

Read at the Pharmaceutical Meeting, Nov. 16th.

A preparation for writing on glass has lately come upon the market under the comprehensive name of "Diamond Ink." It is to be used with a common pen and at once etches a rough surface on the parts of glass it comes in contact with. It proves to be a very useful article for labeling bottles which are to contain liquids that will destroy common labels.

At the request of Professor Maisch an analysis was made, which proved it to be prepared from ammonium fluoride, barium sulphate and sulphuric acid. The barium sulphate seems to act as an absorbing medium and when the semifluid mass is used it makes a white mark and prevents the spreading of the watery liquid; it also seems to make the acid etch a rougher surface.

It is made by mixing barium sulphate 3 parts, ammonium fluoride 1 part and sulphuric acid a quantity sufficient for decomposing the ammonium fluoride and making the mixture of a semifluid consistency.

The sample examined was contained in a glass bottle holding nearly two fluidrachms and which was thickly coated on the outside with asphaltum, on the inside with a very thick stratum of beeswax, and was stoppered with a rubber stopper.

It is claimed by the manufacturer that the mixture contains no hydrofluoric acid and does not corrode a pen, but, of course, it does corrode a pen and hydrofluoric acid is the one thing that does the etching.

Any one making this mixture and wishing to keep it in glass may coat the bottle inside with paraffin, beeswax or rubber. It should be prepared in a leaden dish, and is preferably kept in a gutta percha or leaden bottle.

PRACTICAL NOTES FROM VARIOUS SOURCES.

Musk Mixture.—L. Virlogeux recommends triturating the musk with an equal weight of sugar into an impalpable powder, which is

passed through a very fine sieve and may be preserved for a long time without deteriorating. For 1 gram of musk 2 grams of this powder are weighed out, mixed with 5 centigrams of powdered tragacanth, and the mixture is rapidly emulsionized by adding in small portions the requisite quantity of syrup and water. Thus prepared the mixture contains the musk in a state of very fine division.—*Rép. de Phar.*, 1880, p. 389.

Preservation of Magendie's Solution.—Dr. H. M. Keyes recommends adding one grain of salicylic acid to two ounces of the solution. This has been successfully employed in Roosevelt Hospital for some years.—*Phila. Med. Times*, Nov. 6.

Decomposition of Cinnamon Water.—From a water obtained by distillation from Chinese cinnamon a considerable amount of cinnamic acid had crystallized out on exposure, and in order to obtain more of the acid, J. B. Enz added to this water 10 drops each of oil of Ceylon cinnamon and of pure glycerin. But instead of cinnamic acid there appeared upon the surface of the water colorless very refractive drops of a benzol-like odor. It seems, therefore, that under certain conditions, the cinnamic acid of cinnamon water may be decomposed in the same manner as by distillation with excess of lime into cinnamene and benzol. Whether this decomposition is due to the presence of protein compounds mechanically carried over in distillation or to other causes has not been ascertained.—*Archiv der Phar.*, October, p. 287.

Cod Liver Oil with Iodoform.—Fonssagrives recommends dissolving 0.25 gram of iodoform in 100 grams of cod liver oil and adding 10 drops of oil of anise. The dose is a tablespoonful two or three times a day. The oil of anise improves the odor and taste of cod liver oil.—*Phar. Zeitschr. f. Russl.*, 1880, p. 562.

Detection of Coloring Matter in Beer.—If a dark colored beer is mixed with twice its volume of crystallized (solid) ammonium sulphate and thrice its volume of stronger alcohol, the mixture will deposit a grey precipitate; if roasted malt was used for the beer the precipitate will be dark brown or black, the supernatant liquid being decolorized in both cases. But in case caramel has been added to the beer the above reagents will produce a grey or brown precipitate, and the liquid will retain a brown color.—*Phar. Centralhalle*, 1880, p. 368, from *Der Bierbrauer*.

Glossy Precipitates of Metals on Glass.—A hot solution of nitrate of antimony (prepared from tartar emetic) is agitated in the glass to be

coated, while the latter is externally cooled with water. The thin deposit is washed with water and sulphuretted hydrogen is conducted into the vessel, producing antimony sulphide of a golden color with a green reflection. In a similar manner a black coating of lead sulphide may be obtained by mixing in the glass vessel solution of lead acetate with a little phosphoric acid and an equal bulk of a mixture of water with a volatile oil (oil of turpentine), and passing sulphuretted hydrogen into it. It is advisable to form this coating upon a thin film of antimony sulphide, when it will adhere more firmly to the glass.—*Phar. Centralhalle*, 1880, p. 381, from *Chem. Ztg.*, No. 42.

Preparation of Tincture of Litmus.—Kretzschmar gives the following directions: Finely powdered litmus is exhausted with cold water and the solution mixed with fine sand and evaporated, sufficient hydrochloric acid being added during the evaporation to impart a red color. The dry residue is powdered and, upon large, plain filters, washed with hot and afterwards with cold water. The residue contains Kane's azolitmin, which is the really valuable principle, and is nearly insoluble in pure water; it is dissolved upon a filter by hot water containing a few drops of ammonia, the filtrate is acidulated with sulphuric acid and accurately neutralized by ammonia. If the solution be largely diluted and then acidulated, nearly pure azolitmin is deposited, while a body remains in solution imparting to the liquid a faint wine-red color. The precipitate may subsequently be dissolved in water containing a trace of ammonia, when a brilliantly blue solution will be obtained; but such a degree of purity is scarcely necessary for the use of litmus as an indicator.—*Zeitschr. f. Anal. Chem.*—*Chemiker Zeitung*.

Liquor Arsenicalis Bromati Clementis.—Dissolve pure potassium carbonate and arsenious acid, of each 3.75 grams, in sufficient distilled water to obtain 360 grams of liquid; add 7.5 grams of bromine, and set aside until colorless. The solution, which is said to improve by age, is given in epilepsy in doses of one or two drops once or twice daily.—*Pharm. Zeitschr. f. Russl.*, 1880, p. 573.

The Detection of Free Acid in Acetic Ether is best accomplished, according to Bouvier, by agitating in a small vial 20 or 25 grams of the ether with 3 or 4 grams of litharge, and setting aside for a day. If free acid was present, the litharge will be covered with a white layer. By washing the sediment well with water, drying and weighing it again, the loss in weight of the litharge will give the amount which has been converted into lead acetate, and from this the amount of free acetic

acid is readily calculated.—*Phar. Zeitung*, 1880, p. 477, from *Jour. Phar. et Chim.*

The Gelatinization of Dialyzed Iron is due to the supersaturation of the liquid with ferric hydrate, either in consequence of too long continued dialysis or on account of the absorption of ammonia from the air. Such a gelatinized preparation may be restored again by the careful addition of solution of ferric chloride. From his own observations, Hager regards dialyzed iron as an effectual remedy.—*Phar. Centralhalle*, 1880, p. 387.

Two New Anæsthetics.—Dr. E. Taube reports the results of experiments made with *monochlorethylidene chloride* (spec. grav. 1.372) and *monochlorethylene chloride* (spec. grav. 1.422), which have an odor resembling that of chloroform, and produce anæsthesia without decreasing respiration and circulation. The following products are obtained by the action of chlorine upon ethyl chloride :

Ethyl chloride,	$\text{CH}_3\text{—CH}_2\text{Cl}$	boiling point	12°C.
Ethylene chloride,	$\text{CH}_2\text{Cl—CH}_2\text{Cl}$	“	“ 35
Ethylidene chloride,	$\text{CH}_3\text{—CHCl}_2$	“	“ 60
Monochlorethylene chloride,	$\text{CH}_2\text{Cl—CHCl}_2$	“	“ 115
Monochlorethylidene chloride,	$\text{CH}_3\text{—CCl}_3$	“	“ 75
Dichlorethylene chloride,	$\text{CHCl}_2\text{—CHCl}_2$	“	“ 137
Dichlorethylidene chloride,	$\text{CH}_2\text{Cl—CCl}_3$	“	“ 102
Pentachlorethane,	$\text{CHCl}_2\text{—CCl}_3$	“	“ 146
Perchlorethane,	$\text{CCl}_3\text{—CCl}_3$	“	“ 182

—*Ibid.*, p. 390.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY FREDERICK B. POWER.

On the Amount of Nitrite of Ethyl in Spirit of Nitrous Ether.

By E. Kellström.—The author calls attention to the very great variability in the amount of nitrite of ethyl, as contained in different specimens of the spirit of nitrous ether, and gives the mode of procedure employed in the examination. A certain amount of the preparation is weighed in a strong bottle and digested with an alcoholic potassa solution in the water bath until the ethyl nitrite becomes fully decomposed; the solution, which now contains potassium nitrite, is evaporated on the water bath, the residue again dissolved in water, filtered, diluted with distilled water, acidulated with sulphuric acid, and titrated with a solution of permanganate of potassium.

Different specimens obtained from the pharmacies of Stockholm were found to contain 0.2 to 0.3 and 2.5 per cent., while a specimen prepared in the pharmaceutical institute of Stockholm contained 3 per cent. of ethyl nitrite. An attempt to obtain a considerably stronger preparation by means of refrigeration with ice was unsuccessful, the resulting preparation containing but 3.2 per cent.—*Pharm. Zeitung*, from *Farmaceutisk Tijdschrift*, No. 14, p. 209.

Terebinthina chia (*Chian Turpentine*). By A. Janssen of Florence.—The author having had an opportunity of obtaining through a Grecian physician an authentic specimen of Chian turpentine, collected on the island of Chios from *Pistacia terebinthus*, has considered it of interest to describe its properties and appearance, particularly as the small yield and increased demand for the drug has given rise to its falsification, and the difference between it and that exported from England being considerable. The turpentine obtained from England had the appearance of Canada balsam mixed with more or less Venice turpentine, with a decided terebinthinous odor and taste, a golden yellow color, and brightly liquid, without any observable impurities. That collected by himself had the consistence of old liquid storax, brittle and but slightly sticky when handled.

By transmitted light it is not transparent, but appears tolerably so when thin layers are held towards the light, and would then appear quite transparent were it not for the many dispersed black spots arising from small enclosed particles of the bark of the tree. The color, as observed in a mass, is brown with a greenish tint and in some pieces appears brownish-yellow. The odor is neither that of turpentine nor of fennel, as stated by some, but has much similarity to the odor developed when colophony and yellow wax are melted together; a peculiar aromatic odor must be admitted which has some resemblance to that of lemon. The taste is exceedingly mild, neither bitter nor acid. A solution in rectified spirit is not perfectly clear, gives upon standing an insignificant precipitate, and feebly reddens litmus; in ether, acetone and amylic alcohol it dissolves to form a nearly clear liquid. For internal use it is best prescribed in the form of pills, and the following formula is recommended: Terebinth. chia 4.0 grams, sulphur depurat. 1.5 grams, pulv. rad. glycyrrh. q. s. ut ft. pilul. No. 30. *Signa*. Two pills every 4 hours.

For external use it is best employed according to the following

formula: Terebinth. chia 5.0 grams, vaselin 30.0 grams. Mix with the aid of a gentle heat.—*Pharm. Zeitung*, Oct. 23, 1880.

On the Chlorophyll of Plants. By F. Hoppe-Seyler.—From chlorophyll by means of alcohol two coloring matters may be obtained: a greenish-white in transmitted light red coloring matter, probably identical with the erythrophyll of Bougarel, which crystallizes in needles, and appears in reflected light dark-green, in transmittent light brown. The latter appears to be closely related to the chlorophyll of the living plant; its alcoholic and etherial solutions show the red fluorescence and a strong absorption between B and C, as also bands in yellow and green, which are relatively somewhat more prominent than in freshly prepared chlorophyll solutions. The crystals are permanent, and the analysis gave C 73.4, H 9.7, N 5.62, O 9.57 and P 1.37. The author calls this coloring matter *chlorophyllan*.

The chlorophyllan gives on melting it with potassa a liquid ammonium base with low atomic weight, or perhaps ammonia itself, also in the residue, besides a substance not yet more closely examined an acid of a purplish-red color, soluble in ether, which, after drying with alcohol and a little sodium carbonate solution, and extracting the residue with alcohol gives a beautiful purplish-red strongly fluorescent solution, by the evaporation of which a purplish-red body, easily soluble in water, is obtained. This sodium salt was converted into the barium salt and the latter analyzed: $(C_{21}H_{33}O_3)_2Ba$. The corresponding acid, $C_{21}H_{34}O_3$, is called by the author dichromatic acid, on account of the double fluorescence. By the evaporation of the solution, as also by the action of hydrochloric acid on the sodium and barium salts of the above acid, decomposition products were obtained, the nature of which has not yet been fully determined, although to one of them, on account of a similarity in optical behavior to the so-called *hämato porphyrin* as obtained from hämaglobin or hämatin by the action of strong acids, the name of *phylloporphyrin* has been given.

The author also observes in regard to the crystallized chlorophyll of Gautier that it appears to him to be a mixture of erythrophyll and chlorophyllan with some wax, and rejects the claims of priority of Gautier from the fact that the only notice of this body in "*Bull. Soc. Chim.*," gives neither its properties nor mode of preparation.—*Schw. Wochenschrift für Pharm.* No. 30, 1880, from *Zeitschr. für physiol. Chem.*

PHARMACOGNOSTICAL NOTES.

Strychnos ganthieriana, Pierre.—Catholic missionaries in Tong-King have directed attention to the bark of a climbing shrub called by the natives *hoang-nan*, and used in hydrophobia, against snake bites and in certain skin diseases. The bark is blackish-grey or grey-black, sometimes brownish, mostly covered with a thin ochre-yellow tissue, and always marked with longitudinal ridges. Internally, it shows a lighter and a darker colored layer, and under the microscope are seen, 1, a corky layer; 2, a layer of parenchyma with crystals of calcium oxalate; 3, a pale colored line, consisting of thick-walled stone cells filled with a brown resinous matter, and 4, a layer having double the thickness of the other three layers, and radially striate by thin-walled, roundish cells in 4 or 5 rows, and by vertically elongated cells containing starch granules; near the outer margin of the inner layer are found scattered groups of stone cells. The *hoang-nan* bark resembles the bark of *Strychnos nux vomica* (so-called false angustura), but is more regularly curved, much thinner, upon the outer surface more verrucose, and upon transverse section shows more irregular striæ and fewer stone cells.

The anatomical structure of the two barks and of that of curare of Rio negro is very similar, and in the wood of these plants are numerous large pores visible upon the surface, and having upon transverse section an ellipsoid shape.

Hoang-nan bark contains strychnia and brucia, and is given in doses of about .02 gram ($\frac{1}{3}$ grain). A decoction, tincture and extract of the bark have been recommended. — *Burkhard Raeber*, in *Schweiz. Wochenschr. f. Phar.*, July 16.

Strychnos triplinervia, Mart.—According to Ladislao Metto, this Brazilian plant is distinguished from *Str. castelnaea* and *Str. toxifera* by being tree-like and not climbing, having smooth oval triplinerved leaves and the numerous flowers in cymes. The extracts obtained from different parts of this plant by different methods varied considerably in color; that from the root was rich in gum resin, easily emulsified and almost without activity; but the extracts of the stem- and root-bark resembled curare in their action, and were most active if obtained from bark of medium thickness. Although weaker than curare, which is prepared from several plants, it deserves attention. — *Zeitschr. Oester. Apoth. Ver.*, 1880, p. 428, from *Jour. Phar. et Chim.*

The presence of nicotia in Indian hemp was asserted by Preobraschensky in 1878. E. L. Seezen has examined hemp leaves grown near Riga,

and proved that they are free from the alkaloid named.—*Pharm. Centralhalle*, 1878, p. 369.

Tonga is a new remedy, introduced from the Fijee Islands, and consists of a mixture of bark, leaves and fibres, which, according to Holmes, are probably derived from *Raphisidophora vitiensis*. The remedy is recommended against neuralgia, and is said to contain a volatile alkaloid, *Tongina*. A brown liquid extract of the drug has been made in London.—*Handelsbericht von Gehe & Co.*, September.

Variable Activity of Digitalis.—W. Mayer states that Niemeyer found the leaves of digitalis, grown in the black forest, to be far more active than those of plants growing in Northern Germany. The leaves should be collected during the period of flowering, and only the long-petiolate radical and lower stem-leaves should be used, but not those from the middle or upper part of the stem, which are nearly sessile. A similar observation has been made by Reusch, who found digitalis from mountainous localities much more active than that grown in plains.—*Pharm. Zeitung*.

A Poisonous Star Anise.—*Illicium religiosum*, Siebold, is regarded by many botanists as a variety of *Ill. anisatum*, *Lour.* The latter is indigenous to Cochin China and naturalized in China, is smaller, about eight feet high, has smaller ovate leaves, rounded at both ends, and flowers with more than thirty stamens. *Ill. religiosum* is indigenous to Japan, and the poisonous properties of its leaves and fruit were mentioned already by Siebold. The fruit has some resemblance to star anise, but the carpels are more woody, shorter and boat-shaped, have a rougher surface, are pointed at the ends and curved upwards, and have a camphoraceous or somewhat laurel-like odor and taste, not at all resembling anise. The light-colored, yellowish seeds yield by expression a fixed oil, which is used for illuminating and lubricating, is thickish, yellow or greenish-yellow, of a peculiar odor and taste, contains in the fresh state 5.9 per cent. of free fatty acids and possesses poisonous properties. 2 grams of the powdered seeds produce vomiting, and 10 grams of the oil cause in dogs violent irritation of the stomach and intestines. A preliminary examination, made by A. J. C. Geerts, revealed the absence of an alkaloid.—*Ibid.*, from *Pharm. Weekblad*.

Kola Nuts.—Attention has been recently directed by medical journals to Kola nuts, which, by the natives of Africa, are asserted to promote digestion and ward off inordinate danger, to relieve thirst, to sustain physical strength and to give endurance under prolonged exertions.

They are the seeds of *Sterculia acuminata*, *Beauv.*, a medium sized tree, indigenous to tropical Africa. The fruit consists of five follicles, containing large, reddish or purplish seeds. An allied species, *St. tomentosa*, *Guill. et Per.*, has oval-oblong grey seeds. These, and perhaps others, are known in West Africa as *Kola nuts*, and in Soudan as *guru nuts*. Bentley (Botany) gives the following account: They are largely used in various parts of Africa as food and medicine, and are also commonly stated to be employed to sweeten water, which has become more or less putrid. Their use, however, as a purifier of water is denied by Dr. Daniell. The latter writer made the interesting discovery, which was confirmed by Dr. Attfield, of the presence of theina, the alkaloid of tea, etc., in *Kola nuts*.

NOTES ON CHIAN TURPENTINE.

BY PROFESSOR FLÜCKIGER.

This drug has recently been in much request, as may be seen from the notes in this journal, which have been devoted to this turpentine.

It is not at all probable that a good and regular supply of it could be obtained from Chio. The island, on the whole, has never produced it largely, as already stated in the "Pharmacographia," 2d edition, p. 166.

Pistacia terebinthus being distributed over a very wide area, could well be laid under contribution from other countries. The best plan would perhaps be to go to Algeria. In the Algerian forests the terebinth may be found very frequently, either mixed with oaks and lentisks, or even in clumps in small woods. The trees grow to the height of 50 feet and to more than 6 feet in circumference and attain a very great age. I was surprised some time ago to learn the following statements in regard to the turpentine, which I will translate literally from the "Flore forestière," 3d edition, 1877, p. 72, written by a very competent observer, viz., Mr. A. Mathieu, conservator of forests, and professor in the French School of Forests at Nancy.

"Tears of a white and very fragrant turpentine exude from the bark of *Pistacia terebinthus*; in the hot season they are flowing out in such an abundance that it becomes difficult sometimes to enjoy the shade of the tree. The tears soon solidify. The resin is then termed in Algeria 'lek' or 'alk,' meaning lacker. It is very similar to the 'mastick' of Scio or Chio."

A large terebinth tree will yield 7 to 14 ounces annually.

Mathieu's statement as to the rapid hardening of this turpentine is quite in accordance with the description given in the "Pharmacographia." It may fairly be presumed that the Algerian resin is identical with that originally collected in the island of Chio.

The authors of the "Pharmacographia" are of the opinion that another kind of terebinth, "*Pistacia atlantica*," Desfontaines, growing to a large size all over Northern Africa, is but a variety of *Pistacia terebinthus*, but Mathieu considers them to be distinct trees. However this may be, he further says that *Pistacia atlantica* also affords an abundance of the same turpentine as the genuine *Pistacia terebinthus*. We may further suppose that the supply of products under notice might be largely increased by systematically puncturing the bark.

There is thus a possibility of procuring any quantity of Chio turpentine at a moderate rate, in order to enable the medical profession to settle the question as to the real merits of this old drug, which is singularly again claiming a position in the modern materia medica.—*Pharm. Jour. and Trans.*, October 16, 1880.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER, PH.D.

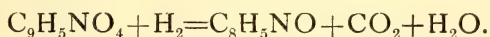
Inorganic Chemistry.—*Separation and Determination of Arsenic.*—Emil Fischer finds that the method proposed simultaneously by Schneider and Fyfe for the separation of arsenic in toxicological examinations by distillation as trichloride is not generally used for the reason that in the ordinary cases the arsenic is gotten as arsenic acid, which is not affected without previous reduction. He finds, moreover, that ferrous chloride is a reagent specially adapted for this reduction, so that the arsenic can be readily converted into arsenious acid and then distilled as trichloride. Thus, by distillation with hydrochloric acid and ferrous chloride, the arsenic is quickly and completely converted into volatile trichloride, while all the other metals of the sulphuretted hydrogen group, including antimony and tin, remain behind in the liquid with the iron. The estimation of the arsenic in the distillate may be made either gravimetrically as trisulphide, according to Bunsen, or better volumetrically, after neutralizing with potassium carbonate with iodine solution. The hydrochloric acid solution, from which the arsenic is to be distilled, may contain sulphuric acid, but not nitric acid. Metallic

alloys are therefore best dissolved in hydrochloric acid, with addition of potassium chlorate. If nitric acid had been used it must be removed beforehand completely by evaporation with excess of sulphuric acid.—*Ber. der Chem. Ges.*, xiii, p. 1778.

On the Detection and Determination of Arsenic in Organic Matter.—Chittenden and Donaldson have given Gautier's method of decomposing organic matter, when mixed with arsenic, a careful revision and have modified it somewhat. It consists essentially of successive oxidations with nitric and sulphuric acids. 100 grams of the suspected material, cut into small pieces, are treated in a casserole with 23 cc. of concentrated nitric acid and the dish heated to 100 to 160°C., with occasional stirring. In one and a-half to two hours the mass, after having been quite thick, becomes liquid, and then the heat is raised to 180°C., when it becomes thick again and of an orange shade. The casserole is then taken from the air-bath and 3 cc. of pure concentrated sulphuric acid added and the mixture well stirred. Powerful oxidation and evolution of nitrous fumes occurs, but no deflagration, and the carbonization is effected without the loss of any arsenic. The casserole being again heated to 180°C., 8 cc. of pure nitric acid are added drop by drop, which effects a more complete oxidation and prevents the formation of any sulphurous acid and consequent production of insoluble arsenious sulphide. On heating now to 200°C. for fifteen minutes a hard carbonaceous residue is the result, free from any nitric acid. In this the arsenic exists readily soluble in water. After extraction with boiling water the reddish-brown fluid is evaporated to dryness on the water-bath, the residue being gotten in one casserole. This residue of arsenic, with a little organic matter, is then dissolved in a definite quantity of dilute sulphuric acid and introduced into the Marsh apparatus. The analytical results quoted show the great accuracy of the method.—*Am. Chem. Journ.*, ii, p. 235.

Organic Chemistry.—*Synthesis of Indigo.*—Although it was announced some years ago that the artificial formation of indigo had been effected, yet the process was so expensive and the yield obtained so trifling that no importance attached to the announcement. Prof. Bæyer of Munich, who made the previous synthesis, has, however, succeeded now in effecting the synthesis in a more direct way, and with a yield almost, if not quite, corresponding to the amount calculated from the material taken. He has, therefore, patented two processes, the general outlines of which are now made public. The starting point of

both of them is cinnamic acid (contained in storax and in Peru and tolu balsams), or rather its derivative, nitro-cinnamic acid, and of this the ortho variety only. This ortho-nitro-cinnamic acid, $C_6H_4(NO_2).C_3H_3O_2$, according to the first procedure, is treated with bromine, yielding $C_6H_4(NO_2)C_3H_3Br_2O_2$; this treated with boiling alcoholic potash solution loses $2HBr$ and yields $C_6H_4(NO_2).C_3HO_2$. This compound, orthonitrophenylpropionic acid by name, when treated by an alkali and reducing agent simultaneously, yields indigo blue according to the following reaction :



Bayer recommends the use of a mixture of glucose and an alkaline carbonate. The reaction takes place very readily at $110^\circ C.$, indigotine separating out in the crystalline form. According to the second process the nitro-cinnamic acid is treated with hypochlorous acid, yielding $C_6H_4(NO_2)C_3H_4ClO_3$ with elimination of H_2O and HCl . This compound, treated with boiling caustic alkalies, yields $C_6H_4(NO_2)C_3H_3O_3$. The simple application of heat ($110^\circ C.$) decomposes this compound orthonitrophenyloxyacrylic acid, yielding indigotine, C_8H_5NO . Bayer prefers, however, the first process, as giving the largest yield and as, moreover, offering the advantage of having the indigo blue produced right in the fibre. Thus, if a textile fibre be impregnated with a mixture of the nitrophenylpropionic acid and the glucose and alkaline salt, and then exposed to a current of superheated steam at $110^\circ C.$, the indigo is produced at once in the fibre. Farther details as to relative cost of production and yield possible will be awaited with great interest. — *Annales de Chim. et de Phys.*, October, 1880, p. 286.

On a New Hydrocarbon from Coal Tar, called Picene.—O. Burg has extracted from the last products of the distillation of coaltar pitch a new hydrocarbon, to which he gives the name picene. When purified by crystallization from boiling cumol it was gotten in the form of white scales, showing a blue fluorescence. An analysis established for it the formula $C_{22}H_{14}$. It is insoluble in most solvents, dissolving only in slight amount in boiling glacial acetic acid, benzol and chloroform. Its best solvent is that portion of the light oil of coal tar boiling at 150 to $170^\circ C.$ Its fusing point is $345^\circ C.$, the highest fusing point of any known hydrocarbon. Burg prepared also its quinone, called picequinone, $C_{22}H_{12}O_2$, and the bromine derivative $C_{22}H_{12}Br_2$.

Picene forms a new member of the series of hydrocarbons, which commences with benzol, C_6H_6 , and which includes naphthalene $C_{10}H_8$,

anthracene, $C_{14}H_{10}$, chrysene, $C_{18}H_{12}$ and picene, $C_{22}H_{14}$.—*Ber. der Chem. Ges.*, xiii, p. 1834.

On the Nature of Caucasian Petroleum.—The Russian chemists Beilstein and Kurbatow have made a chemical study of the petroleum now produced in such large amounts in the Caucasus. It had been observed that the Russian oils of the same boiling point as American petroleums had a much higher specific gravity, and that so far from this impairing their burning qualities, they yield a light-giving power 10 per cent. higher than the American oils. This higher specific gravity, moreover, made it possible to obtain from the Russian oils lubricating oils of the best quality (even up to 0.940 specific gravity) without the admixture of any solid materials. The Russian chemists directed their study especially to the more volatile portions of the crude oil. Thus the fraction boiling under $80^{\circ}C$. was found to have a specific gravity of 0.717, while hexane, the paraffin hydrocarbon of the same boiling point, has a specific gravity of 0.669; the fraction between 95 to $100^{\circ}C$. had a specific gravity of 0.748, while heptane has a specific gravity of .699. The first supposition of the investigators was that the Russian oils were mixtures of the paraffin series and the aromatic or benzol series. However, they could not find a trace of the benzol series in any of the fractions. An analysis of the 80 to $85^{\circ}C$. fraction gave results corresponding, not with the formula C_7H_{16} , but C_7H_{14} . The hydrocarbons of the Russian oil are not, however, members of the olefine series, C_nH_{2n} , as bromine has no action upon them, except in the way of substitution. They are the hydrogen addition products of the benzol series of hydrocarbons. Wreden had studied these and found for

Hexahydrobenzol,	C_6H_{12}	0.76 sp. gr.	$69^{\circ}C$. boiling point.
Hexahydrotoluol,	C_7H_{14}	0.772	$97^{\circ}C$.
Hexahydroisoxylol,	C_8H_{16}	0.777	$118^{\circ}C$.

Beilstein and Kurbatow substantiated this view of the composition of the oil by preparing derivatives like trinitroisoxylol, identical with that prepared from metaxylol of coal tar. Farther observations upon these Caucasian oils are promised.—*Ibid.*, p. 1818.

Differences between Petroleum Spirit and Allied Liquids.—A. H. Allen, in a paper read before the British Association at Swansea, 1880, sums up the differences between petroleum spirit, shale naphtha and coal-tar naphtha, as follows:

	Petroleum spirit.	Shale naphtha.	Coal-tar naphtha and benzol.
1. Leading constituents,	Heptane, C_7H_{16} , its homologues.	Heptylene, C_7H_{14} , its homologues.	Benzin, C_6H_6 , its homologues.
2. Sp. gr. of sample at $15.5^\circ C.$,	0.690	0.718	0.876
3. Boilg point of sample,	$55^\circ C.$	$56^\circ C.$	$80^\circ C.$
4. Solvent action of sample on coal-tar pitch,	Very slight solvent action. Liquor only amber-yellow after prolonged contact.	Behaves similarly to petroleum spirit.	Readily dissolves pitch, forming deep brown solution.
5. Behavior of sample on agitating 3 parts of it (cold) with 1 part of fused crystals of absolute carbolic acid (Calvert's).			
	No apparent solution. The liquids are not miscible.	The liquids form a homogeneous mixture.	The liquids form a homogeneous mixture.

—*Chem. News*, Oct. 15, 1880, p. 189.

Technical Chemistry.—*Recent improvements in the Manufacture of Coal-tar Colors.*—Prof. J. W. Mallet, in a recent review of the development of the coloring industry, makes the following statements: In regard to the original so-called anilin colors, one of the most important changes has been the application on the great scale of Coupier's process, or a modification of it, for making anilin red (rosanilin salts) without the use of arsenic. This process, consisting essentially in heating together, in the presence of an acid, nitro-benzin and commercial anilin oil of high boiling point, rich in toluidin, has been adopted by several of the largest manufacturers. The important researches of E. and O. Fischer, Rosenstiehl, and Dale and Schorlemmer, have proved that under the name rosanilin have been included both isomeric and homologous bases of generally similar character, and Dale and Schorlemmer have shown that of these para-rostanilin with the formula $C_{19}H_{17}N_3$ (identical with that made from para-toluidin) may be prepared from phenol, by converting this into aurin, $C_{19}H_{14}O_3$, and heating the latter with an excess of aqueous ammonia; while, if aurin be heated with anilin, the final product is tri-phenyl para-rostanilin, thus establishing full connection between phenol and the whole series of anilin colors.

The original anilin violet of Hofmann, obtained by the methylation of pre-formed rostanilin salts, has been to a large extent replaced by the "violet de Paris," made by first heating anilin under pressure with methyl chloride or methylic alcohol and hydrochloric acid, thus obtaining methylated anilin derivatives, and then oxidizing such product by heating it in the air, mixed with sand and a salt of one of the heavy

métals, usually cupric nitrate, to facilitate the oxidation process. The finest phenylated blues are now made by heating together very pure rosanilin (made by Coupier's process) and a large excess of pure anilin and benzoic or stearic acid, preferably the former. Anilin green, *vert lumière*, is now made by heating methyl salts with methyl anilin violet, thus dispensing with the costly use of iodine. But methyl green has itself been largely replaced of late by *malachite green*, made by the action of benzoyl tri-chloride on dimethyl anilin, the color so obtained exhibiting superior stability in comparison with the methyl and iodine greens.

The beautiful resorcline derivative eosine is of comparatively recent introduction, and has established its claim to be considered a valuable addition to the resources of the dyer. The phthaleins of phenol, resorcline, and other phenolic substances, have of late been converted into eosine and analogous coloring matter by using instead of bromine itself a mixture of a bromide and bromate (or corresponding chlorine or iodine compounds) with acetic acid or some other weak acid; and alkaline hypochlorates have also been employed to thus modify the preparation of aureosine and other colors of the eosine class, whose beauty is, unfortunately, not equalled by their permanence. The tri atomic phenol pyrogallol has given rise to the dyes "galleine" and "coeruleine."

It is needless to say that artificial alizarin from anthracene has within ten years replaced, to an immense extent, the natural madder, and become recognized in the very front rank of artificial coloring materials. —*Am. Chem. Jour.*, ii, p. 263.

SOME FACTS CONCERNING THE MORPHIA AND OPIUM TRADE IN THE UNITED STATES.

BY R. F. FAIRTHORNE, PH.G.

When man lost his claim to innocent perfection by his disobedience to the divine command he obtained possession of the knowledge of two great powers, namely, of good and evil. These, through various agencies, he has employed ever since. His acquaintance with the effects of opium may be considered one of these agents and reckoned as an inheritance, for which in the present day he may be thankful or

not, according to the use made of it, whether beneficially applied for the alleviation of suffering, or used in such a manner as to be a bane and a curse enervating the faculties of both body and mind.

The most potent constituent of opium, morphia, was discovered by the German apothecary Sertürner, in 1816. Ludwig had observed a crystalline deposit from strong solutions of opium as early as 1688, which was probably meconate of morphia, which he named *Magisterium opii*; but to Sertürner certainly belongs the credit of determining its character as a vegetable basic compound—the first active principle separated of this nature.

Within fifteen years of the date first named, George B. Brown and G. D. Rosengarten, chemists, of Philadelphia, began the manufacture of morphia, and supplied the druggists of this and other cities of the United States with it, and so quickly did its use become popular Mr. Rosengarten informed me that he estimated his production of it during the first three years at 5,000 ounces a year. Previous to its introduction to the trade, black drop and McMunn's elixir of opium were extensively used, which, on account of their freedom from narcotina, were not bad substitutes.

Mr. Samuel F. Troth, an old and esteemed citizen of Philadelphia, whose connection with the drug business began in 1816, gave me several interesting details concerning the subject of this paper; amongst other things he states, in answer to the question whether there was any prejudice against its use at first, "I do not recollect of any prejudice against morphia at its first introduction; on the contrary, it was considered a great and valuable discovery." He also states that this article, as made by Mr. Rosengarten, did not differ very materially in appearance from that produced at present, except that it was not quite as white. Mr. Wm. Weightman (the surviving representative of the firm of Powers & Weightman), on the other hand, informs me that the morphia which they obtained from Europe about this time was by no means pure, containing a considerable amount of impurity, and was of a light brown color; so that, judging from what I have heard from these gentlemen and others engaged in the retail business even at this early period, these firms manifested that progressiveness and excellence in character of their products, for which they have been noted ever since.

I have endeavored to ascertain the price of morphia at this time,

but have not been able to do so. In 1831, however, Mr. Troth bought some of the acetate at \$8.50 an ounce, and the next year he purchased 18 ounces, at an average price of \$7.80 an ounce. In 1841 he obtained some at \$2.52 an ounce, and quinia at \$2.50. Through Mr. Weightman I am enabled to furnish the price of sulphate of morphia for each year from 1848 to 1872, inclusive. The price per ounce averaged:

In 1848,	\$3.08	In 1857,	\$4.25	In 1865,	\$8.75
1849,	3.00	1858,	4.37	1866,	7.84
1850,	3.50	1859,	4.85	1867,	6.87
1851,	3.08	1860,	5.00	1868,	8.26
1852,	3.37	1861,	4.50	1869,	10.98
1853,	3.06	1862,	4.75	1870,	8.87
1854,	3.62	1863,	7.00	1871,	6.18
1855,	4.12	1864,	9.20	1872,	5.37
1856,	4.34				

During the year 1868 the price of opium in bond (gold value) gradually rose from \$4.75, in July, to \$11 a pound, in December, the duty on the same being \$2.50 a pound, and in January, 1869, it brought \$12.50 in bond.

It has been impossible for me to find out how much morphia is now made and used in the United States, but I have reason to fear that the amount is very large. One manufacturer estimates the average annually bought by the retail druggists at about $2\frac{1}{2}$ ounces each. This coincides with my own experience after a long connection with the retail business, and, as there are now about 25,000 druggists in the United States, the amount annually consumed would be 62,500 ounces.

Another large manufacturer estimates that about 25 per cent. of Turkish opium that comes to this country is used in the production of morphia salts. During the year ending June 4th, 1880, there were 2,480 cases of opium (Smyrna) imported. The average weight of each case is about 150 pounds, making a total of 372,000 pounds. Twenty-five per cent. of this would be 93,000 pounds.

If we place the yield of morphia in dry opium at 10 per cent., we shall arrive at the following result: Opium loses by drying about 20 per cent., therefore 93,000 pounds would be reduced to 74,400 pounds by loss of water, and would yield 7,440 pounds of morphia, or 119,040 ounces, a fearfully large amount, one that I sincerely hope and believe

is an over-estimate. I fear, however, that the quantity produced cannot be less than 65,000 ounces annually during the past three years. The consumption of this amount is appalling enough without considering the use made of the remaining 279,000 pounds of opium. The value of 65,000 ounces of morphia, at \$5 an ounce, would be \$325,000. This is, perhaps, calculated at too high a figure, but it cannot be far from \$300,000.

It will not, perhaps, be out of place here to state the amount of opium received in the United States at various periods ; it was :

In 1859, 71,839 lbs.	In 1877, 230,102 lbs.
1860, 135,000 (estimated)	1878, 207,752
1867, 135,305	1879, 278,554
1876, 228,742	1880, 372,000 (estimated)

During the year ending June the 4th last, the following amounts of Smyrna opium were sent :

To the United States,	2,480 cases, or 372,000 pounds
Holland,	293 43,950
England,	791 118,650
France,	47 7,050
Spain,	120 18,000
Italy,	12 1,800
Germany,	85 12,750
China,	246 36,900
Making a total of	4,074 611,100

Why so much larger quantity is consumed in this country than in Europe it would be difficult to determine. The greater number of persons suffering here with neuralgic troubles cannot possibly account for it. Nearly five-eighths of the whole Turkish crop is used by us. It is time that every physician and druggist should use his utmost efforts to restrain the improper use of opium. Undeserving, indeed, is he of the name of good citizen who carelessly dispenses these or other pernicious drugs for the sake of paltry gain.

If these figures of the consumption of opium are startling, what will be thought of the amount sent to China of Indian opium, namely, 91,200 cases during the year 1879, the value of which was £12,993,-979. What a fearful responsibility rests upon those who encourage and foster such a nefarious trade !

NOTE ON INDIAN HENBANE.

BY THOS. GREENISH. F.C.S., F.R.M.S.

Among the samples of interesting drugs which reach the Museum of the Pharmaceutical Society, either through its honorary and corresponding members or other scientific men, the products of India, our own colonies or those of other countries there is an ample field for scientific research, and one in which the youth of our profession may serve the cause of pharmacy, and at the same time earn distinction for themselves.

It is, from every point of view, desirable that the numerous vegetable products of tropical and other countries, introduced as remedial agents, should, as early as may be convenient, be thoroughly examined, and if there be present in any one of them an active proximate principle or residual agent that it may be recognized as an aid to therapeutic science; or, on the contrary, if possessing only some astringent or other less valuable constituent, it may be relegated to its proper place as an addition to a class of bodies of which we at present possess so ample a store.

It is sometimes difficult to determine whether it be a loss to therapeutics or a gain to true pharmacy; but, nevertheless, there is the fact, and it is daily exemplified, that the more plentiful supply of the raw material sends a large number of new therapeutic agents into the list of forgotten or neglected remedies.

The official biennial henbane leaf has of late years become very scarce in this country, and it was with considerable interest that, at the request of Mr. Holmes, I undertook the examination of a small sample of henbane leaf sent from India. It arrived in a tin box, without any particulars as to its being the produce of the annual or biennial plant, place of growth, character of soil, the result of cultivation or otherwise. The quantity at my disposal was only $3\frac{1}{2}$ drachms. On removal from the tin the leaves had a clammy feel; they possessed an intense odor, on the hand very persistent, and generally stronger than that of any henbane that had previously come under my notice.

With so small a quantity of leaf the tincture seemed the most suitable official preparation to make. For this purpose it was placed in a drying-closet at a temperature of about 80°F., and with a loss of 14 grams or 7 per cent. was reduced to a coarse powder, as directed in the Pharmacopœia. It was remarked how quickly and almost entirely the

peculiar odor of the henbane, just referred to, passed off in the process of drying.

The tincture was prepared by maceration, and after standing the usual time, pressed off and filtered. Compared with the official tincture of the British Pharmacopœia, made with biennial henbane, by transmitted light it was brown-olive, whereas the official tincture is olive-green, and the color more intense. A little of the tincture of Indian henbane added to water produced no opalescence, and gave only a tinge of color; the official tincture, on the contrary, produced considerable opacity, which, on the addition of a little liquor potassæ, disappeared.

In the general structure of the leaf I could perceive no very material difference, but a section of the midrib showed much more vascular structure than one from the same part of indigenous biennial henbane; but more extended observation will be required on the histology of the two plants before any definite conclusion can be arrived at as to their identity.

Extracts made from the two tinctures were relatively 3.43 for the Indian henbane, as compared with 4.20 for the British Pharmacopœia; but on this point also further experiment, and with larger quantities, is desirable.

As regards the difference in color, it is probable that under a tropical sun one of the elements of the chlorophyll of the Indian henbane had been in part decomposed, and hence the brown of that tincture as compared with the green of the official. The two samples also were respectively viewed in the spectroscope, when the Indian tincture showed an absorption band in the red, smaller, and not so clearly defined as that of the tincture from the indigenous biennial. This would also indicate a loss of chlorophyll as just referred to. The relative difference in the yield of extract of the two tinctures may receive its solution in the greater vascular development of the Indian as compared with the indigenous leaf. The quantity of tincture was too small for reliable conclusions as to any difference in the therapeutic value of the two tinctures. That question must be left to a larger supply of material for its solution.

Pereira, quoting Mr. Houlter, states, in reference to indigenous biennial henbane, that "when fresh it has a strong, unpleasant and narcotic odor, a mucilaginous, slightly acid taste, and a clammy feel; and that by drying it almost wholly loses these properties." Reference has

already been made to the more intense odor of the Indian henbane, and it may therefore be worth while to determine on a small quantity of a given sample the amount of loss suffered in the process of drying, and allowing for that loss to make a tincture with the leaf without previously drying it, so that the strong odor which is probably due to some volatile principle, and also the acidity, may together be retained, and probably increase the therapeutic value of the product.

It is to be wished that a larger supply of this henbane leaf, with full particulars on those points of its history previously referred to, may reach this country for the institution of more exact experiments to determine the relative value of the two henbanes; but these references may serve to turn attention to another probable source for an official plant now, and for some years past, very scarce in this country.

I am inclined to think that the Indian henbane, from its very intense odor, probably the result of climatic influences, may supply a therapeutic agent more volatile than any one of the official preparations from indigenous henbane.—*Pharm. Journ. and Trans.*, Sept. 25, 1880.

THE ALKALOIDS OF DITA BARK.¹

BY O. HESSE.

Apothecary Gruppe, of Manilla, prepared from dita bark, the bark of *Alstonia scholaris* (syn. *Echites scholaris*), a substance that he named "ditain," which he represented to be obtained in the same way as quinia is from cinchona bark. This alleged method of preparation appears to have given rise to the idea with some that this ditain was a peculiar vegetable base, notwithstanding that from the communications of Hildwein ("Pharm. Central," 1873, No. 26; "Neues Repert.," xxii, p. 561) and Gorup-Besanez ("Annalen der Chemie," clxxvi, p. 88) it became evident that the preparation in question was nothing but an extract. However, Gorup-Besanez separated from 30 grams of ditain, according to Stas' method, a very small quantity of a strong non-volatile and crystallizable alkaloid, though this was not sufficient for further examination. (See also "Am. Jour. Pharm.," 1873, p. 316; 1876, pp. 221 and 369.)

Before, however, Gorup-Besanez directed the attention of chemists to ditain, Julius Jobst and the author undertook an examination of dita bark itself. This investigation led to the discovery of an alkaloid pre-

¹Abstract of a paper in the "Annalen der Chemie," vol. cciii, p. 144.

cipitable from solutions of its salts by ammonia, which they named "ditamine," and another substance presenting much similarity to the alkaloids, inasmuch as it formed a compound with oxalic acid, but differing in that it did not pass into ether and similar solvents when treated with an excess of ammonia. Other attempts made to isolate this substance were unsuccessful, and the naming of it was deferred until further experiment should disclose its nature.

Meanwhile, dita bark, as appears from a later paper by Harnack ("Archiv f. exp. Path. u. Pharmacologie," viii, p. 126), was worked upon by E. Merck, who succeeded in preparing from it a crystallizable base, which, in 1876, he showed at the Exhibition of Scientific Apparatus, at South Kensington. Harnack examined this substance, which Merck considered to be pure ditamine,¹ and found that in the supposed ditamine there was present the hydrochlorate of an active vegetable base, which, having obtained from ether in crystals, he named "crystallized ditaine." Harnack further came to the opinion, like Merck, that dita bark contained no basic substance besides this alkaloid.

Hereupon, in a paper entitled "Historische Notiz über Ditain," Husemann ("Archiv f. Pharmacie," ccxii, p. 438) declared that ditaine had long before been prepared by Scharlee, and named "alstonine." This led the author of the present paper (Hesse) to make some remarks upon the subject ("Berichte," xi, p. 1547), and as Harnack's investigation was then unknown to him, and Husemann in his paper had treated Grappe's and Harnack's "ditains" as identical, he thought Harnack's investigation had been carried out with dita extract. This error induced Harnack to publish an extract from his paper in the "Journal of the German Chemical Society," xi, 2004, in which he stated that dita bark contained only one alkaloid, namely, "crystallized ditain," and he considered, therefore, that Hesse's communication, according to which dita bark contained two alkaloids, ditamine and echitamine, was due to imperfect observation.

In the present paper, therefore, Hesse describes exhaustively these two alkaloids, together with a third, "echitenine." The last-named has been known to him some time, but a communication respecting it has been delayed until it was ascertained whether this alkaloid was actually contained in the bark, or was first formed during the preparation of the other two.

¹Merck at first designated this substance "dittamine," but appears subsequently to have chosen for it the name of "ditaine."

Ditamine.—Ditamine is very easily prepared by the process described by Jobst and Hesse ("Pharm. Journ." [3], vol. ii, p. 144), which consists, after a preliminary treatment of the bark with petroleum spirit, in supersaturating an alcoholic extract of dita bark with soda, shaking out the alkaloid with ether, and obtaining it from the ethereal solution in the usual way. If ammonia be used instead of soda more or less of other substances separate with it, which, passing also into the ethereal solution, render the obtaining of the ditamine in a pure state much more difficult.

From the solution supersaturated with soda it is difficult to remove the last traces of ditamine by means of ether, and light petroleum spirit does not act more favorably, notwithstanding that it separates somewhat better from the basic solution.

¶ The amount of ditamine in dita bark was estimated in a subsequent experiment at 0.04 per cent. In that case the powdered bark, without previous treatment with petroleum spirit, was extracted directly with hot alcohol, and the extract obtained upon the evaporation of the alcohol was treated with dilute acetic acid in order to bring as much as possible of the alkaloid retained by the resinous bodies into solution. The clear filtered solution was then supersaturated with soda, shaken with ether, and the ethereal solution treated with a small quantity of acetic acid. After the acetic solution had been separated from the ether it was saturated with ammonia in excess, and the precipitated alkaloid shaken out with pure ether, which, upon evaporation, left it as a yellowish varnish.

According to these results it might have been expected that from 10 kilograms of dita bark 4 grams of ditamine would be obtained. But the process followed was that first described, and only 0.4 gram of alkaloid was obtained. About nine-tenths of the alkaloid had disappeared in the process, and probably was contained in the before-mentioned resinous mass. With the small quantity of ditamine thus obtained all the statements respecting this alkaloid previously put forward by Jobst and the author were confirmed.

Ditamine dissolves very readily in dilute acetic or hydrochloric acid, as well as in dilute acids generally, and from such solutions it is precipitated by excess of ammonia in white amorphous flocks. In this it is distinguishable from echitamine, the alkaloid next described, which is not precipitated from its saline solutions by ammonia. The two alkaloids present another difference, not easily mistaken. If to a con-

concentrated acetic solution of ditamine a few drops of strong hydrochloric acid be added it remains perfectly clear, whilst in a similar solution of echitamine a dense crystalline precipitate is soon formed, the commencement of which is promoted by stirring the liquid with a glass rod.

The small quantity of ditamine at the author's disposal did not allow of the composition of the free base being ascertained by analysis; but the platinum salt, obtained in light yellow amorphous flocks by precipitating an aqueous hydrochloric solution with platinum solution, gave figures corresponding with the formula $(C_{16}H_{19}NO_2, HCl)_2 + PtCl_4$. The free alkaloid would therefore have the formula $C_{16}H_{19}NO_2$.

Echitamine.—After the ditamine has been, in the way described, removed as entirely as possible, the remaining solution is neutralized with acetic or sulphuric acid, and carefully evaporated until it equals one-fifteenth to one-twentieth the weight of the bark used. To the solution, whilst still warm, some hydrochloric acid and chloride of sodium is added, which produces a resinous precipitate that soon becomes crystalline. The addition of sodium chloride is continued until it is observed that the precipitated resin no longer alters its form upon standing. After 24 hours the precipitate is collected, washed with concentrated hydrochloric acid and purified by crystallization from boiling water. As hydrochlorate of echitamine is almost insoluble in concentrated hydrochloric acid, the crystallization from water, which, as a rule, is rather slow, may be hastened by adding hydrochloric acid to the solution. The hydrochlorate is then thrown down as a white crystalline powder.

Echitamine may also be prepared by adding fused potash to the before-mentioned basic aqueous solution that remains after the removal of the ditamine and shaking with chloroform. The chloroform takes up the alkaloid present, which is partly suspended and partly in solution, and gives it upon evaporation as an amorphous residue, which, upon treatment with a little concentrated hydrochloric acid, very easily yields the hydrochlorate pure.

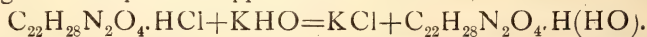
From the pure salt the free alkaloid can easily be obtained by dissolving it in the smallest possible quantity of hot water, adding to the solution saturated solution of potash, or preferably fused potash, and shaking out the free base, which separates in white flocks, with ether or chloroform. In either case there remains after slow evaporation an amorphous residue, which, upon drying in the exsiccator, at first shrivels up and then cracks. Only in very exceptional cases does this

residue show here and there indications of crystallization. Upon dissolving this residue in strong alcohol, or in a mixture of equal parts of acetone and water, the pure base is obtained upon spontaneous evaporation of the solution in a chamber free from carbonic acid in thick obliquely truncated glassy prisms.

An analysis of the air-dried substance gave results corresponding with the formula $C_{22}H_{28}N_2O_4 + 4H_2O$. Upon placing the air dried crystals in an exsiccator they lost 1 molecule of water; when further dried in a partial vacuum (about 400 mm.) at $80^\circ C$. they lost 2 molecules more, and the fourth molecule was given off with difficulty, and after some time, upon raising the temperature to $105^\circ C$. Upon exposure to moist air this anhydrous substance quickly took up 1 molecule of water, again forming the compound $C_{22}H_{28}N_2O_4 + H_2O$. The same compound is obtained upon treating the residue left by the evaporation of the ethereal or chloroform solution with hot acetone. The basic mass at first swells up, and is eventually converted into a magma of delicate white amorphous flocks, which, washed with cold acetone, dried in an exsiccator and pulverized, form a white powder, having the composition of the monohydrate.

The last traces of the last molecule of water are very persistent, and can scarcely be got rid of without decomposition taking place. Moreover, the dry residue obtained at $105^\circ C$. is almost without action upon red litmus paper, whilst that containing 1 molecule of water sharply colors such paper blue. It would consequently appear that this 1 molecule of water has a special signification towards echitamine, and that by its loss a much weaker base is formed from a strong one.

This substance formed by drying at $105^\circ C$. has, however, the peculiarity that when treated with hydrochloric or other acids the original base is again formed. This recalls in some measure the formation of chloride of ammonium when hydrochloric acid and ammonia are brought together. But when chloride of ammonium is decomposed with potassium hydrate the nitrogen base splits up into ammonia and water, whilst in the case of the organic base under consideration, when it is decomposed with potassium hydrate, the water remains combined, and is only given off upon the application of heat.



Consequently, the author calls the compound with one molecule of water, $C_{22}H_{28}N_2O_4 \cdot H_2O$, "echitammoniumhydroxide," yielding echitamine by the loss of 1 molecule of water.

Echitammoniumhydroxide.—Echitammoniumhydroxide dissolves tolerably readily in water, and still more easily in alcohol, communicating to the solution a strongly basic reaction. It dissolves when freshly precipitated rather easily in chloroform and ether, but is very slightly soluble in coal benzin and nearly insoluble in petroleum spirit. When the alkaloid has assumed the crystalline form it dissolves with difficulty in ether. Both the ethereal and the chloroform solutions, upon spontaneous evaporation, leave the alkaloid in the amorphous condition, though sometimes the amorphous mass shows distinct traces of crystallization.

The aqueous solution of echitammoniumhydroxide throws down from solutions of cupric chloride, ferric chloride and alum the oxyhydrates, without redissolving these precipitates. In solution of acetate of lead the solution produces a voluminous precipitate of hydrated oxide of lead, which is partially redissolved in the precipitant. Echitammoniumhydroxide also displaces the ammonia from chloride of ammonium, and sets free the alkaline hydrates from solution of sodium and potassium chlorides, echitammonium chloride being formed and separating in crystals. The sodium chloride is decomposed very quickly, but potassium chloride requires some time.

When heated quickly in capillary tubes to 206°C ., echitammoniumhydroxide melts and becomes colored through the formation of a black scum. It is optically active, rotating the beam of polarized light to the left. With sulphuric acid it is colored an intense purple-red, but the color becomes paler upon warming. Both the alkaloid and its chloride dissolve with a purple-red color in concentrated nitric acid, but after some minutes this color disappears and the solution becomes intensely green. Bromine produces in the aqueous solution of the alkaloid a yellow flocculent precipitate that dissolves upon heating. Anhydrous acetic acid dissolves the base very readily. Upon warming, the solution becomes brownish.

Echitammonium, the author thinks, is probably the most strongly basic of all the alkaloids and appears to be monovalent. It neutralizes acids completely, forming salts, some of which are crystallizable. The chloride, $\text{C}_{22}\text{H}_{29}\text{N}_2\text{O}_4\text{Cl}$ or $\text{C}_{22}\text{H}_{28}\text{N}_2\text{O}_4\cdot\text{HCl}$, is obtained in colorless shining needles upon treating an aqueous solution of the alkaloid or one of its easily soluble salts with concentrated hydrochloric acid or solution of sodium chloride. It dissolves moderately freely in hot, but with difficulty in cold water, forming sometimes in the latter

a supersaturated solution, from which the salt immediately crystallizes on the addition of a couple of drops of hydrochloric acid. It is almost insoluble in concentrated hydrochloric acid and solution of chloride of sodium. A large number of other salts, which have been prepared and examined by the author, are described in detail in the original paper. The author also describes an oxidation product, which he provisionally calls "oxyechitamine," produced when a solution of the base is allowed to evaporate while exposed to the air.

Echitenine.—Echitenine remains in the first mother-liquor after the precipitation of the echitammonium chloride. It may be obtained either by precipitating with mercuric chloride and decomposing the precipitate with sulphuretted hydrogen, etc., or by saturating the mother-liquor with soda, shaking with chloroform and evaporating, in either case manipulating so as to get the hydrochloric compound of the alkaloid in concentrated solution. This is done by simply evaporating the solution resulting from the decomposition of the mercuric salt, or in the other case dissolving the chloroform residue in concentrated hydrochloric acid. After standing some time the clear solution is filtered, supersaturated with soda solution and shaken with chloroform. The chloroform solution is then washed with water, treated with animal charcoal and finally evaporated, when the echitenine is left as a brownish residue. After perfect drying, this residue becomes very brittle and springs in brownish lamellæ from the sides of the vessel. It retains some chloroform, which is only driven off completely at a temperature of 100°C . The dry substance, when analyzed, gave results corresponding with the formula $\text{C}_{20}\text{H}_{27}\text{NO}_4$.

Echitenine forms, when pulverized, a brownish strongly bitter tasting powder, which melts at above 120°C . It dissolves with a reddish-violet color in concentrated sulphuric acid and in concentrated nitric acid with a purple color, passing quickly into green and finally into yellow. If the powder is simply exposed to the vapor of nitric acid it becomes colored an intensely blue-green.

Echitenine dissolves freely in alcohol, imparting to it an alkaline reaction. It also dissolves readily, especially when freshly precipitated, in chloroform and ether, less readily in water, and in petroleum spirit it is almost insoluble. Its solution in dilute hydrochloric acid gives a yellow flocculent precipitate upon the addition of potassium or sodium hydrate; as also does ammonia if the solution be moderately

concentrated. Even solution of soda produces a precipitate in a concentrated solution, but not in a dilute one.

Echitenine forms true salts with acids, but they are amorphous, and with few exceptions are unsuited for investigation.

In conclusion, in comparing echitammoniumhydroxide with ditamine and echitine, the other bases accompanying it in dita bark, it is at once apparent that they contain only half the proportion of nitrogen, and the author thinks that this difference may also be partially an expression of the relation which these bases show toward acids. Though differing in this respect, they appear to belong, as indicated by the nitric acid reaction, to a common group, and the author believes that they are part of a series which he represents of follows:

Ditamine,	.	.	.	.	.	$C_{16}H_{19}NO_2$.
?	.	.	.	.	.	$C_{18}H_{23}NO_3$.
Echitenine,	.	.	.	.	.	$C_{20}H_{27}NO_4$.
Echitammoniumhydroxide,	.	.	.	.	.	$C_{22}H_{30}N_2O_5$.

Echitammoniumhydroxide would therefore, according to this view, be the most perfect basic product occurring in the *Alstonia scholaris*.—*Pharm. Jour. and Trans.*, Oct. 23, 1880.

CHINESE WHITE WAX.¹

From an article in the "British Mail" on the white wax industry of China, it seems that the average annual value of this peculiar crop amounts to about £650,000. From Hankow alone upwards of £81,000 worth of this wax was exported in 1879. The Chinese white wax is a deposit found on twigs of *Ligustrum lucidum*, and caused by the puncture of an insect. It is said that in Keenchang district the plant thrives in great abundance, and in the spring of the year the twigs are covered with countless swarms of flies having the appearance of a brown film. The branches soon become covered with a white soap-like incrustation, which increases in volume till the commencement of the fall of the year, when the sprays are cut off and immersed in water which is kept boiling. "The viscid substance rises to the surface, and is skimmed off, melted, and allowed to cool in deep pans. It was accidentally discovered, that by transporting the insects from their native districts to the more vigorous one of Keating-fu, in the north of the province, their power of discharging wax was largely augmented—a

¹ From the "Gardeners' Chronicle," October 2, 1880.

property which was promptly and extensively availed of by the Szechuen traders. The period between evening and morning is chosen for conveyance, because many hours of sunlight would precipitate the hatching. This should take place only after the females have been attached to the trees. Arrived at their destination, six or more of the mothers—which are enormously prolific—are tied, wrapped in a palm leaf, to a branch of the ligustrum. A few days later the young flies are swarming on the twigs, where they fulfill their mission by the month of August; then they perish in the cauldrons, where the results are immediately collected. It is stated that this peculiar industry requires the exercise of great care and forethought.”—*Pharm. Jour. and Trans.*, October 16, 1880.

VARIETIES.

A Digestive Ferment of the Juice of the Fig-Tree.—The milky juice, which is found in small quantity in the common fig-tree, was collected in Provence in the month of April. 5 grams of the partially coagulated substance, consisting of a syrupy liquid, and a white, sticky, resinous, elastic, aromatic coagulum were mixed with 60 grams distilled water, 10 grams of moist fibrin added, and the mixture kept at a temperature of 50°. In less than 24 hours the fibrin was completely digested, leaving a small quantity of white, homogeneous residue. A further quantity of 10 grams, then 12, then 15, in all 90 grams of fibrin were added in the course of a month. Each successive quantity was completely digested in 24 hours, and each left a white residue, the composition of which has not been determined. The liquid showed no signs of fermentation or putrefaction.—*Jour. Chem. Soc.* October, 1880. *Comptes Rendus.*

Oxalic Acid in Beet Leaves.—Investigations made by A. Müller show that the fresh leaves of the sugar-beet contain 4 per cent. oxalic acid, of which one-third is in a soluble form. When it is considered how great are the quantities of these leaves eaten by cattle in countries where the beet root sugar industry is large, it behoves farmers to be on their guard, as the acid induces inflammation of the mucous coats of the stomach. The pickling of the leaves with chalk is likely to prevent this unpleasantness, the soluble acid being converted into calcium oxalate, which is insoluble in the weak acids of the stomach.—*Jour. Chem. Soc.*, October, 1880, p. 733.

Pilocarpin as an Antidote to Atropin.—Dr. Purjesz, of Buda-Pest, relates in the “Centralbl. für Prakt. Augenheilk.” the case of a patient, aged 19, who took, for medical purpose, a water solution of nearly two grains and a-half of sulphate of atropin. When the patient was seen by him, an hour afterwards, the symptoms of poisoning were very severe. He at once administered, by subcutaneous injection,

muriate of pilocarpin in doses of 0.4 grain every five or ten minutes; the quantity given amounted in all to 6.4 grains. The result was remarkable; the toxic symptoms gradually receded, and at the end of three hours from the time of taking the atropia the patient had quite recovered. Even the dilatation of the pupils, which had taken place to the greatest extent, had completely passed off.

Homatropia hydrobromate, prepared by Merck, of Darmstadt, has been the subject of experiments by Dr. Henry L. Schell, who reports his observations in the "Philadelphia Medical Times" of October 9th, arriving at the following conclusions:

1. Homatropin hydrobromate is not well adapted to the treatment of inflammatory or traumatic affections of the eye, on account of the conjunctival irritation it produces.

2. It is especially adapted to the production of that temporary dilatation of the pupil and paralysis of the ciliary muscle which is so often required in examining the condition of the refraction.

3. The best solution to use is one containing 16 grains to the fluidounce of distilled water. From one to five drops of such a solution may be required to produce the desired effect, according to the strength and activity of the ciliary muscle.

4. Under the influence of a full dose the pupil attains its maximum dilatation in about twenty minutes.

5. With a full dose the accommodation begins to fail in about ten minutes and is usually totally suppressed in a half-hour, although exceptional cases may require an hour. This total suppression lasts about three hours; the accommodation then gradually recovers itself, and is fully in action again at the end of from ten to thirty hours from the time of the last instillation.

6. The local action of the mydriatic is not accompanied by any unpleasant effects upon the general system.

Cheken—A New Remedy.—Dr. Henry Von Dessauer, of Valparaiso, has used cheken for some years in the treatment of a number of complaints. Thus as an inhalation he uses it in diphtheria, laryngitis, bronchitis and bronchorrhea; as an injection in certain infections of the mucous membrane, as gonorrhea, leucorrhea, cystitis, etc., while given internally, in the form of syrup or liquid extract, it is said to aid digestion, allay cough, facilitate expectoration, and stimulate the kidneys to action. It is also an astringent, and is found to be of especial service in threatened hemoptysis. Dr. von Dessauer used it with marked success in more than one hundred cases of bronchitis and phthisis. For many years he was physician to a large convent school, many of the inmates of which suffered from consumption, and hemoptysis being of constant occurrence. During the two and a-half years that he gave cheken in this establishment he had not a single death from phthisis, there were no fresh cases of hemoptysis, and many of the patients who had had repeated attacks of bleeding from the lungs recovered and gained flesh and strength in a very marked manner.—*Louisv. Med. News*, October 2d.

The Coca in Opium-Habit.—In your issue of May 29th I noticed an article, from the pen of Dr. Palmer, upon coca as a possible antidote for the opium-habit.

At that time I had under my treatment Capt. C., who was suffering from the morphia-habit. He was wounded in the left leg at the battle of Nashville during Hood's raid through Tennessee, and had it amputated at the middle third of the thigh. He contracted the morphia-habit to alleviate the intense pain, and continued it for several years. Five years ago he quit taking the drug, and abstained till last spring, when he went to Louisiana from Middle Tennessee, where his physician prescribed morphia in conjunction with quinia for the relief of malarial poisoning. The old habit soon returned with all its pristine force. When he came back I found him in the condition described above—gloomy, despondent, and threatening to commit suicide.

As soon as I read Dr. Palmer's article I determined to give the coca a fair test, and am able to report that the result was a most happy one. He has been using the coca *ad libitum* for more than a week, and now, instead of taking three grains of morphia several times a day, is entirely relieved of this habit with all its distressing effects, and is happy, hopeful and cheerful.

I hope all other physicians will try this new remedy in cases of this kind, and report through the "News" and other medical journals, as I, for one, am deeply interested in the result.—J. G. CORE, M.D., in *Louisville Med. News—Therapeutic Gazette*, July, 1880.

To Disguise Cod Liver Oil.—Dr. Peuteves, in the "France Médicale," recommends, in order to render cod liver oil tasteless, to mix a tablespoonful of it intimately with the yolk of an egg, add a few drops of essence of peppermint and half a tumbler of sugared water, so as to obtain a *lait du poule* ("Med. Press and Circular"). By this means the taste and characteristic odor of the oil is entirely covered, and the patients take it without the slightest repugnance. Besides, the oil being thus rendered miscible with water in all proportions, is in as complete state of emulsion as the fats at the moment they penetrate the chyle vessels, consequently absorption is better assured.—*Louisv. Med. News*, Oct. 9.

Digestion in Plants.—Dr. Lawson Tait has recently investigated afresh the digestive principle of plants. While he has obtained complete proof of a digestive process in cephalotus, nepenthes, dionœa and the droseraceæ, he entirely failed with sarracenia and darlingtonia. The fluid separated from the drosera binata he found to contain two substances, to which he gives the names "droserin" and "azerin." Dr. Tait confirms Sir J. D. Hooker's statement that the fluid removed from the living pitcher of nepenthes into a glass vessel does not digest. A series of experiments led him to the conclusion that the acid must resemble lactic acid, at least in its properties. The glands in the pitchers of nepenthes he states to be quite analogous to the peptic follicles of the human stomach; and when the process of digestion is conducted with albumen, the products are exactly the same as when pepsin is engaged. The results give the same reactions with reagents, especially the characteristic violet with oxide of copper and potash, and there can be no doubt that they are peptones.—*Med. and Surg. Reporter*, Nov. 13.

Coca.—Concerning this remedy, which has lately been prominently before the profession, Dr. D. H. McDonald, of Quincy, Ind., writes to the "Louisville Medical News," July 17th, 1880:

"There can be no question of the potency of coca, and in the hands of the intelligent physician much good may be expected from its use. But do take your trenchant pen and give us a slashing article against the indiscriminate use of it. You know a confirmed chewer of coca is called a coquero. Among the Spanish Americans a coquero is considered hopelessly lost, with no prospect of reformation. Look at the picture drawn by Von Tschudi: 'The inveterate coquero is known at first glance. His unsteady gait, his yellow skin, his dim and sunken eyes encircled by a purple ring, his quivering lips, and his general apathy, all bear evidence of the baneful effects of the coca juice, when taken in excess.'

"Surely this picture is enough to startle any one: but I know that some cannot be startled if there is a prospect of satisfying an appetite; therefore the need of a warning in time, to the profession as well as the masses, against the indiscriminate use of a drug which is apt to be followed by the blasted life of the coquero."

Separating Wheat from Chaff.—Mr. Humpidge contributes, in London "Nature," a very timely *résumé* of the present state of our knowledge by the array of new (?) elements, the announcements of which were lately heralded to the chemical world with such startling rapidity that the question of their genuineness has since been involved in much doubt. We condense in the following his conclusions:

Of *Davyum*, which was announced in July, 1877, by Sergius Kern, as a new metal belonging to the platinum group, the author thinks that the investigator failed to take the necessary precautions to get rid of iron and the platinum metals, or at least that he does not state the means he adopted to do so. He holds, therefore, that this alleged discovery may be safely ignored.

The numerous metals of the yttrium group that have been announced are more difficult to discriminate between, because of their close relationship.

He goes into considerable detail in analyzing the claims of these numerous announcements to recognition, and presents the present state of our knowledge of them in the following scheme, which shows their status at a glance:

	NAME.	Symbol and atomic weight.	Discoverer.
	Scandium (doubtful)	Sc = 45	Nilson.
	Yttrium	Y = 89	Bunsen and Clève.
Probably identical.	Phillipium	Pp = 111	Delafontaine.
	Unnamed metal of Soret	{ Atomic weight }	Soret.
	Thulium	{ undetermined }	Clève.
Probably identical.	X of Soret	{ Atomic weight }	Soret.
	Holmium	{ undetermined }	Clève.
	Terbium	Tr = 147	Marignac.
Probably identical.	Samarium (doubtful)	At. w't und't'm'd	Boisbaudran.
	Decipium (doubtful)	Dp = 159	Delafontaine.
	Y β	149.4	Marignac.
	Y α	156.7	Marignac.
	Erbium	Er	Mosander.
	Ytterbium	Yb = 172	Marignac.

(Phillipium, the unnamed metal of Soret, Thulium, X of Soret, Holmium, Samarium, Decipium, Y β , and Erbium give distinct absorptive spectra.)

Two alleged discoveries by Dr. Lawrence Smith, one of an earth unnamed, in the gadolinite of North Carolina, and another, which he alleged to be identical with the X of Soret, are not recognized by the author.

Of *Norwegium* and *Vesbium*, Mr. Humpidge says that, for the present, the chemical world must suspend judgment, since up to the present time we are without confirmation of their existence.

We are, as will be observed from the above, gradually finding our way out of the labyrinth of conflicting and duplicated discoveries which have puzzled chemists so much for the past few years, and may reasonably expect to see in the near future the wheat separated from the chaff.—*Engineering and Mining Journal*, Sept. 4.

Nettle Tea in Urticaria has been successfully used by Dr. Murrell in connection with a solution of carbolic acid (1 in 1,000), locally, and a bath twice daily consisting of sodium carbonate and water.—*The Lancet*.

Removal of Stains and Spots.—*Matter Adhering Mechanically*—Beating, brushing and currents of water, either on the upper or under side.

Gum, Sugar, Jelly, etc.—Simply washing with water at a hand heat.

Grease.—White goods, wash with soap or alkaline lyes. Colored cottons, wash with lukewarm soap lyes. Colored woollens, the same or ammonia. Silks, absorb with French chalk or fuller's earth, and dissolve away with benzin or ether.

Oil Colors, Varnish and Resins.—On white or colored linens, cottons or woollens, use rectified oil of turpentine, alcohol lye and their soap. On silks, use benzin, ether and mild soap, very cautiously.

Stearin.—In all cases, strong, pure alcohol.

Vegetable Colors, Fruit, Red Wine and Red Ink.—On white goods, sulphur fumes or chlorine water. Colored cottons and woollens, wash with lukewarm soap lye or ammonia. Silk the same, but more cautiously.

Alizarin Inks.—White goods, tartaric acid, the more concentrated the older are the spots. On colored cottons and woollens and on silks, dilute tartaric acid is applied cautiously.

Blood and Albuminoid Matters.—Steeping in lukewarm water. If pepsin or the juice of *Carica papaya* can be procured, the spots are first softened with lukewarm water, and then either of these substances is applied.

Iron Spots and Black Ink.—White goods, hot oxalic acid, dilute muriatic acid, with little fragments of tin. On fast dyed cottons and woollens, citric acid is cautiously and repeatedly applied. Silks, impossible.

Lime and Alkalies.—White goods, simple washing. Colored cottons, woollens and silks are moistened, and very dilute citric acid is applied with the finger end.

Acids, Vinegar, Sour Wine, Must, Sour Fruits.—White goods, simple washing, followed up by chlorine water if a fruit color accompanies the acid. Colored cottons, woollens and silks are very carefully moistened with dilute ammonia, with the finger end. [In case of delicate colors, it will be found preferable to make some prepared chalk into a thin paste, with water, and apply it to the spots.]

Tanning from Chestnuts, Green Walnuts, etc., or Leather.—White goods, hot

chlorine water and concentrated tartaric acid. Colored cottons, woollens and silks, apply dilute chlorine water cautiously to the spot, washing it away, and reapplying it several times.

Tar, Cart Wheel Grease, Mixtures of Fat, Rosin, Carbon and Acetic Acid.—On white goods, soap and oil of turpentine, alternating with streams of water. Colored cottons and woollens, rub in with lard, let lie, soap, let lie again, and treat alternately with oil of turpentine and water. Silks the same, more carefully, using benzoin instead of oil of turpentine.

Scorching.—White goods, rub well with linen rags dipped in chlorine water. Colored cottons, redye if possible, or in woolen raise a fresh surface. Silks, no remedy.—*Muster Zeitung für Faerberei, Druckerei, etc., from Chemical Review.*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, November 16th, 1880.

On motion of Mr. Wm. McIntyre, Mr. Alonzo Robbins was called to the chair. The minutes of the last meeting having been read, and no corrections being made, they were approved. Professor Bedford being present, was introduced.

Dr. L. Wolff read a paper upon an improved method of *preparing substances for hypodermic medication*; the paper was listened to with much interest, and on motion was referred to the Publishing Committee. (See page 593.)

Mr. F. L. Slocum read a paper upon an *ink for writing upon glass*, a bottle thus marked was exhibited, and the paper was referred to the Publishing Committee. (See page 600.)

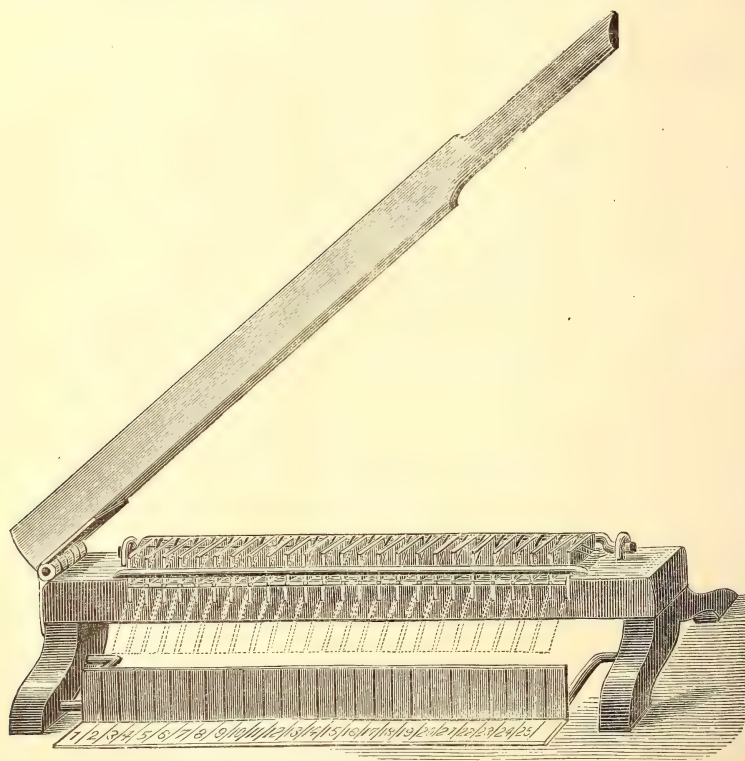
Mr. McCoy read a paper upon the estimation of iron in solution of ferric chloride, which was also, upon motion, referred to the Publishing Committee. (See p. 598.)

Professor Remington exhibited an apparatus designed by Mr. Addison White, Ph.G., for dividing pill masses. The cut will assist in illustrating the device. The machine consists of a walnut base, into the upper surface of which twenty five narrow brass strips are driven to the depth of $\frac{1}{4}$ inch, about $\frac{3}{8}$ inch apart. A lever is hinged to the base, and attached to the side is a graduated bar, the graduations corresponding to the spaces between the brass strips. On the other side of the base a brass rod, armed with twenty-five movable brass tongues, is adjusted, so that when these are not in use they lie flat upon the base out of the way. To use the divider the pill mass is rolled out in the usual way into a cylinder and laid upon the graduated bar resting upon the table. The bar is now elevated and the cylinder is deposited upon the raised cutters, the lever is brought down which divides the cylindrical pill mass, forcing it into the spaces; the bar carrying the tongues is now raised and the divided pill mass is quickly deposited upon the graduated bar, the whole operation taking much less time than to describe it.

Professor Remington also exhibited an *apparatus for gelatin-coating pills*, invented by Mr. Maynard, of Chicago, and performed the operation in the presence of the meeting. The neatness and adaptability of the apparatus to the purpose designed elicited the approval of all; the method of packing the pills after finishing also elicited attention for its neatness and efficiency.

Mr. J. Elliott Shaw was invited to explain and exhibited *Burgess' portable mechan-*

ical blow-pipe. The general appearance of the blow-pipe is shown in Fig. 1, and its internal construction will be readily understood by referring to Fig. 2, which is a central vertical section. The pump cylinder is mounted on an arched stand and contains a piston having a valve opening upward. The piston is connected to the foot pedal by a forked connecting rod, and is moved by a slight and easy motion of the foot. The upper end of the pump cylinder is closed, with the exception of a valve aperture, which is covered by a valve opening upward into a cylindrical air reservoir secured to the upper end of the pump. Near the top of the air reservoir there is a nipple to which is attached a flexible tube communicating to the blow-pipe. The pipe outlet is much smaller than in the mouth blow-pipe to permit of maintaining a pressure, which may be increased or diminished by a quick or slow

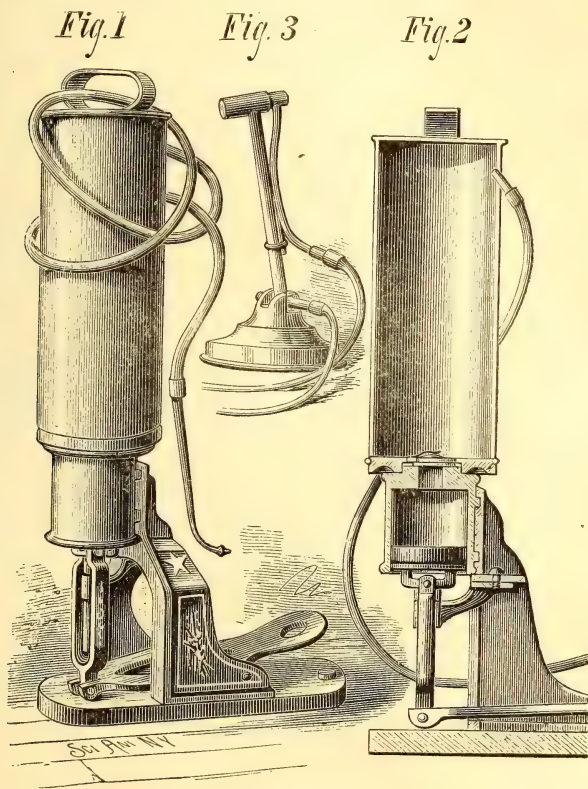


WHITE'S PILL MASS DIVIDER.

motion of the treadle. The air chamber is easily filled, and when charged affords a constant supply of pure air. The machine is light and portable, weighing but 12 pounds and measuring 24 inches in height. The pump cylinder is $2\frac{1}{2}$ inches in diameter, with 3 inches stroke. For light and delicate work when a gentle flame is required, a pressure of one or two pounds is given, but for brazing, annealing, fusing, etc., when a large flame is necessary, a few rapid strokes of the plunger will raise the pressure in the receiver to from 10 to 12 pounds, which can be sustained

with but little exertion. Under this pressure the air is driven through the minute opening in the blow-pipe nipple with great force. The blow-pipe may be used effectively with a gas, alcohol or oil flame, also for creating a draft in the use of charcoal or coke in connection with the small smelting furnaces now so largely in use. Fig. 3 represents a compound bench blow-pipe, which possesses a rocking motion, enabling the flame to be used in any position.

Mr. Shinn exhibited specimens of *Quebracho bark*, both dark and white, which is recommended for asthmatic affections; it is quite astringent, and is used in South America for tanning leather.



Professor Maisch exhibited a specimen of very handsome *senega root*, which he presented to the cabinet of the college; this specimen was peculiar in having very long and rather thin branches of much brighter appearance than usual. He also exhibited a specimen of a root which appears to be largely sold for *senega*; while doubtless a product of a *polygala*, it was wanting that peculiar carinated line which distinguishes the *senega* so completely from other roots, and has a central wood which, in all parts, is nearly circular upon transverse section.

Professor Maisch presented a piece of *lead pipe* which had been connected for nearly ten years with a circulating boiler in a dwelling in this city. The pipe could

be easily broken, the metal being quite granular and in numerous places forming larger and smaller cavities, which contained crystalline red oxide of lead.

Professor Remington inquired if any present had seen so-called *Quassia Cups* made from other than quassia wood; he had been informed that some had been put on the market in a Western State.

Mr. McIntyre inquired whether there was any process known for completely deodorizing *coal oil* or *benzin*. In reply, it was stated that lime was used with some effect, but did not completely remove the odor.

A very handsome sample of *neats-foot oil* was presented to the cabinet; it was stated that this oil was now a commercial article being constantly supplied to the trade.

After a short discussion upon several different topics the meeting, on motion, adjourned.

THOS. S. WIEGAND, *Registrar*.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Alumni Association, Philadelphia College of Pharmacy.—The first social meeting was held Oct. 12th, President Hugh Campbell in the chair.

Dr. A. W. Miller addressed the meeting on the subject of *prescriptions*, giving the derivation of the word, explaining the difference between officinal and magistral preparations, and stating the reasons for the general adoption of the Latin language in prescriptions. The lecturer then explained the various signs used in prescriptions, and their proper construction, the abbreviations and some of the Latin terms which are occasionally employed in the directions.

Mr. L. E. Sayre described the flower heads of *Pyrethrum roseum*, and made some experiments upon flies and tadpoles, to show the prompt effect upon them of the pure powder, while some of the commercial insect powders were not at all efficacious. Dr. Miller remarked that the microscope would most likely be the best means for discovering adulterations in insect powder.

After some remarks on the arrangement of a collection of materia medica specimens for the use of students, one question each in materia medica, chemistry and pharmacy was announced to be answered in writing by the members of the class, after which the meeting adjourned.

At the second meeting, held Nov. 9th, Mr. Krewson occupied the chair, and Mr. Cook delivered a discourse on natural orders of plants, their limits and systematic arrangement. Dr. Miller illustrated and explained the symbols that were in use by the alchemists, after which the report of the delegates from the Alumni Association to the meeting of the American Pharmaceutical Association at Saratoga was read, and some remarks made by Dr. Miller on the numerous mineral springs of that watering place, and on some of the most interesting features of the exhibition which was held during the meeting of the National Association. A number of specimens were shown, and several questions propounded to the members of the class. The meeting then adjourned.

EDITORIAL DEPARTMENT.

The General Index for the last ten volumes of the "American Journal of Pharmacy" is nearly ready in manuscript; but we find that, if we would adhere to our intention of issuing it with the December number, it would delay the appearance of the latter too long. For this reason, it will be mailed with the next issue, in January, to all subscribers. We embrace this occasion of expressing our thanks to our friends, readers as well as contributors, hoping that they will continue such in the future, and extend the influence of the JOURNAL by contributions to its pages, as well as by calling to it the attention of those interested.

The End of Two Bogus Colleges.—On page 527 of the present volume we have given, as a matter of history, the legal proceedings that put an end to the existence of two chartered institutions, which, from the manner they were conducted, were discreditable to the colleges of the United States. We now can inform our readers that on Nov. 12th Dr. John Buchanan pleaded guilty to two indictments charging the sale of an academic degree. Sentence was deferred.

On Nov. 24th the same Dr. Buchanan and M. V. Chapman, in the United States District Court, were found guilty of conspiring to defraud the United States out of \$5,000, the amount of Buchanan's bail. The statute imposes a fine of not less than \$1,000 nor more than \$10,000, and an imprisonment of two years. In this case sentence has also been deferred, and the principal is soon to expect another trial on the charge of using the mail for fraudulent purposes.

The Thalleioquin Test.—Referring to Mr. Zeller's paper on this subject, on page 385 of this volume, Mr. J. Denham Smith writes to the "Chemical News" that the discoverer of this test was H. A. Meeson, whose communication, dated "Guy's Hospital, Jan. 7, 1835," was published in the "Philosophical Magazine and Journal of Science" for that year.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Druggists' Pocket Price Book for Wholesalers, Retailers and Traveling Salesmen. Cleveland, O.: John H. Nelson. 1880.

On page 432 of our last volume we noticed Mr. Nelson's druggists' cost-book. The book before us is gotten up essentially on the plan then described, but its smaller size, and some modifications in the internal arrangement, render it, we think, more convenient for use.

The Physician's Visiting List for 1881. Philadelphia: Lindsay & Blakiston.

The one before us is the thirtieth annual publication of the visiting list, and will be found most conveniently arranged for the use of those for whom it is intended.

Introduction to the Study of Chemical Reactions. By Dr. phil. Edmund Drechsel, Professor of Physiological Chemistry at Leipzig University. Translated with permission of the author and of the publisher, and specially adapted to the use of American students by notes, etc. By N. Fred. Merrill, S.B., Ph.D. New York: John Wiley & Sons. 1880. 12mo., pp. 138.

Chemistry cannot be mastered without a thorough understanding of chemical reactions. A work, endeavoring to explain these, must naturally be devoted to a theoretical consideration of the various changes which take place under different conditions. Such is the case with the little work before us, and, as might be expected, the theories at the present time, adopted by a large number of chemists, are fully considered and ably explained. The book will, therefore, be found very useful to those who enter upon the study of chemistry, or who desire to acquaint themselves with the modern theories bearing upon composition and decomposition. The translator and editor has performed his task well, and the numerous foot-notes and the occasional additions to the text enhance the value of the book. But, in a few cases, the statements are not quite as exact as might be desired. We select from the chapter on "solution of the metals and metallic oxides," where it is stated that, "indeed, iron in a finely divided state, such as that resulting from a reduction of ferric oxide by hydrogen, is pyrophorous, taking fire at once in the air, and, glowing, burns to ferric oxide." This sentence certainly deserves to be rendered with greater precision.

Proceedings of the Convention of Druggists and of the North Carolina Pharmaceutical Association. Munroe, N. C. Pp. 25.

The Convention was held in the Senate chamber at Raleigh, August 11th, and at once proceeded to organize a State pharmaceutical association, a constitution and by-laws being adopted at the afternoon session and the following officers elected: President, E. M. Nadal, of Wilson; Vice Presidents—S. J. Hinsdale, of Fayetteville, Wm. Simpson, of Raleigh, and E. H. Meadows, of Newbern; Secretary, T. C. Smith, of Charlotte; Treasurer, J. S. Pescud, of Raleigh. On the following day the draft of a pharmacy law was discussed, and among the committees appointed was one for memorializing the Legislature in relation to the passage of the pharmacy law.

Proceedings of the Ohio State Pharmaceutical Association at its second Meeting, held at Dayton, O., May 19, 1880. Cleveland, O. Pp. 32.

A brief report of this meeting will be found on page 382 of the "Journal." Among the papers read was one by Mr. R. C. Clark on the *preparation of soft paraffin*, similar to cosmolin, vaselin, petrolina, etc., by the following process:

Take a quantity of crude paraffin, such as settles in the bottom of oil tanks, and which is known in the oil regions as B. S. oil, and add, if necessary to lower the melting point, a sufficient quantity of crude petroleum rich in paraffin, such as Smith's Ferry oil; place the whole in a still and distill off at as low a temperature as possible all oils above 43° Baumé. Filter the residuum through animal charcoal at a temperature of from 150 to 180°F. To make an exceedingly fine article it will

require 3 pounds of residuum and $2\frac{1}{2}$ or 3 pounds of animal charcoal for one pound of finished goods; 2 pounds of residuum will remain in the charcoal.

A paper on *Oleate of mercury* was read by Mr. N. Rosenwasser, in which the author advocates its preparation by combining 5 parts of red mercuric oxide with 13 parts of oleic acid at a temperature of 220°F ., and diluting this to 20 parts by the addition of soft paraffin, which is stated to prevent oxidation and to materially cheapen the product. For liquid oleates paraffin oil will probably answer equally well.

Das Verhalten der Bacterien des Fleischwassers gegen einige Antiseptica. Von Nicolai Jalan de la Croix. Dorpat, 1880. Pp. 110.

The behavior of the bacteria of meatinfusion to several antiseptics.

The infusion was prepared both cold and at the boiling temperature and the experiments made under various conditions, which were alike in each series for the antiseptics tried. The effectiveness for preventing the development of bacteria was found to be in the following order: Chlorine (1 in 30208), corrosive sublimate (1:25250), chlorinated lime (1:11135), sulphurous acid (1:6448), bromine, sulphuric acid, iodine, aluminium acetate, volatile oil of mustard, benzoic acid (1:2867), sodium borosalicylate, picric acid (1:2005), thymol (1:1340), salicylic acid (1:1003), potassium permanganate, carbolic acid (1:669), chloroform, borax, alcohol, eucalyptol. The destruction of living bacteria was still effected by chlorine diluted to 22768, but not by corrosive sublimate if diluted to 6500 parts.

Ein Beitrag zur Kenntniss des Levulins, Triticins und Sinistrins. Von Adolf Weyher v. Reidemeister. Dorpat, 1880. Pp. 61.

A contribution to the knowledge of levulin, triticin and sinistrin.

Levulin was prepared from the tubers of *Helianthus tuberosus*, triticin from the rhizome of *Triticum repens*, and sinistrin from squill. Triticin is easily converted into fruit sugar, partly already by boiling with water, while levulin and sinistrin are not altered by heating their solutions in sealed glass tubes to 100°C . On the other hand, levulin ferments much more rapidly with yeast than triticin and sinistrin. The last two bodies have not been obtained optically inactive, but in the purest state attainable remained levogyre, though in a less degree than had been previously observed by others. Triticin is isomeric with saccharose, while levulin and sinistrin belong to the dextrin group. Levulin sugar and sinistrin sugar are free from dextrose, but rotate polarized light less than levulose.

OBITUARY.

MR. STEPHEN E. MERRIHEW died on the 1st of November, after an illness of six days. The deceased was born at Marcus Hook, Pa., in the year 1802, and removed in early boyhood to the city of Wilmington, Del., where he learned the business of printer, and for some years worked at the trade. He then removed to this city and was employed by Mr. Jno. Grigg, then largely interested in publishing medical

works, and, among others, the "American Journal of Pharmacy" was issued, with his imprint. After a few years Mr. Merrihew entered into business for himself, and in partnership first with Mr. L. C. Gunn and then with Lewis Thompson; he was engaged in printing the Journal ever since it was regularly published. The earnestness, strict integrity and attention to business, which ever characterized him, made him respected among all who knew him, and we feel that it is but fitting that some record of one whose whole business career has been intimately connected with the publication of this journal should be made upon our pages as a tribute to his worth, and to give expression to the regret his death has occasioned.

PROFESSOR DR. PHILIPP PHÖBUS died July 1st. He was born at the Prussian town of Märkisch-Friedland, May 27, 1804, studied medicine, and in 1843 became Professor of Pharmacology at the University of Giessen. Besides several books and pamphlets, he wrote a large number of essays on physical, mineralogical, botanical, pharmaceutical, anatomical and medical subjects. The deceased was one of the most zealous and able advocates for the elevation of pharmacy, and the author of a draft for a German pharmacy law, which was finished in the fall of 1875, but has not been published. He also contributed largely to the International Pharmacopœia, the work on which was begun in 1868 by a number of prominent European pharmacists.

DR. J. RUDOLF VON WAGNER, Professor of Technology at the University of Würzburg, died there October 5, in the 58th year of his age. He had previously been Lecturer on Chemistry in his native city, Leipzig, and Professor at the Polytechnic School of Nuremberg. He wrote a history of chemistry, edited a German edition of Gerhard's Chemistry, and was the author of the well-known hand-book on chemical technology. The Bavarian government sent him as an expert to several international expositions, among them also to that held at Philadelphia in 1876.

DR. CARL PHILIPP FALCK, Professor of Pharmacology at the University of Marburg, died June 30, in the 64th year of his age. For several years previous to 1857 he was one of the contributors to the well-known Cannstatt's Jahresbericht, and wrote the reports on pharmaco-dynamics and toxicology.

WALTER W. KOEHLER, a graduate of the Philadelphia College of Pharmacy, Class 1877, died recently of heart disease, at St. Augustine, Fla., aged 23 years. He was a Philadelphian by birth, and for about two years prior to his death carried on, in connection with his brother, a retail drug store in Brooklyn, N. Y.

PROFESSOR WILHELM PHILIPP SCHIMPER died, in Strassburg, March 20th, in the 73d year of his life. He was born in Lower Alsace, and in 1835, became Naturalist of the Geological and Mineralogical Museum, and in 1862 Professor of Geology at Strassburg, which position he held until 1879. The deceased was well known for his researches in botany, zoology and mineralogy. He was the uncle of the botanists Carl Friedrich and Wilhelm Schimper, and his son Wilhelm has already become known for his botanical researches.

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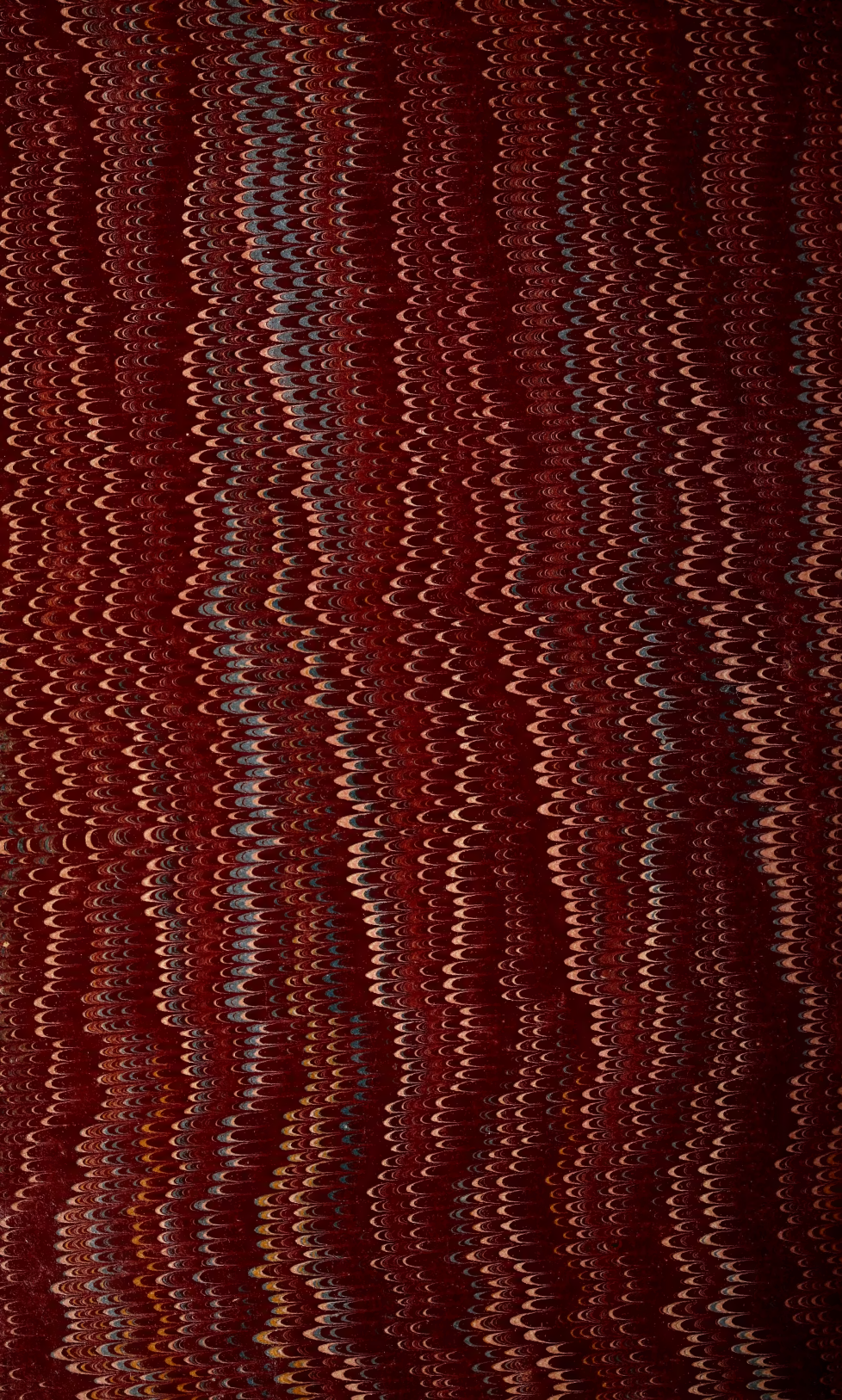
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